The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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Notes and Comments

A Five-Day-Week Experiment

THE proprietors of THE CHEMICAL AGE were among the pioneers of the five-day working week which has since been adopted by a large number of progressive business houses, and we shall therefore watch with particular interest the progress of the experimental introduction of the system for the benefit of the five thousand employees of Boots Pure Drug Co., Ltd., at the company's Nottingham factories. Lord Trent announced last week that the good results anticipated when the new factory was built are now being realised, the modern plant and methods having made production more efficient. On the experience gained during the next five months the directors will decide whether the five-day week can be made permanent. The system will be reviewed in all its bearings in September to discover whether it has been justified by its results and whether it will be practicable to maintain the five-day working week during the busier winter months.

Lord Trent says the verdict to be reached in the autumn will depend on the answers that can be given to three main questions: (1) Has the scheme in any way impaired the company's service to the public? (2) Is the cost of the scheme such that we can afford to continue it? and (3) If the five-day week can be worked permanently in the summer, can it be maintained with equally satisfactory results in the winter? Given a full measure of co-operation between employees and employers we have little doubt as to the ultimate success of the experiment.

Disappointment in the Provinces

THE candid discussion on the amalgamation of chemical organisations at the annual meeting of the Newcastle section of the Society of Chemical Industry, reported last week, confirms the opinion we have long held that the provinces are much more determined to get things done than are the people at the headquarters of the various societies in London. They view the problem from an entirely different angle; possibly, of course, the men at headquarters would reply that they only see one side of the question. At all events Newcastle has expressed its disappointment that the question of amalgamation is proceeding so slowly and has urged immediate steps to secure some sort of amalgamation. Why not, says Mr. E. M. Myers, let those societies willing to link up do so forthwith, and let the others stay out if they care to do so? The suggestion is the most sensible one made so far, and if adopted would very soon prompt the backward societies to take some kind of action.

We shall be interested to see whether Dr. J. T. Dunn, himself a member of the Newcastle section and a participant in the discussion referred to, follows it up in his presidential address to the Society of Chemical Industry, which is due to be held at Cardiff in July. Amalgamation has been a pet topic for presidential addresses as long as we can remember, and Dr. Dunn, with the Newcastle meeting fresh in his memory, will be certain to make reference to the subject.

The Lure of Letters

PROFESSOR RILEY'S remarks at the Newcastle meeting upon the relative importance of the Society of Chemical Industry and the Institute of Chemistry cannot be ignored. With the extension of University courses to cover every phase of chemistry the diplomas of the Institute mean nothing that cannot also apply to University degrees; we fail to understand why a course should be taken in a University to obtain "letters" not conferred by the University. The economic affairs of the chemist are but scantily catered for by the Institute; the British Association of Chemists does that sort of thing so much better. If in addition, as Professor Riley mentions, over half the subscriptions of the Institute are spent on administration, we are constrained to wonder what members receive for their money.

Professor Riley suggested that the Society of Chemical Industry might solve its difficulties by allowing members to use the letters F.S.C.I. We interpret that remark as a subtle joke against the value of "letters" conferred by another society of chemists. The importance that the partially educated (scientifically and technically) attach to the possession of a piece of parchment paper signed by someone they have never heard of and given by a society of which they know nothing, but stating that if they wish they may put the alphabet after their names, is astonishing. Cannot steps be taken to see that when "letters" are used they shall have some definite meaning and be real evidence of training, experience and qualification? Cannot some legal restriction be introduced to prevent the use of qualifications that mean nothing? Even some of the older "letters" have lost their potency.

Who, for example, ever uses " F.C.S. " to-day unless he possesses no other—or too many others? Any society which almost anyone may enter if he pays the subscription should be rigorously denied the privilege of granting letters.

Research Associations

IT was a happy thought of the Department of Industrial and Scientific Research to convene a conference to discuss the future policy of research associations. This conference was attended by more than a hundred representatives. Representation was not confined to the directors of research and their staff, but comprised heads of businesses on whose behalf the associations operate. It is to this latter fact (not clearly brought out in the official communication) that the decisions and recommendations of the conference owe their intrinsic importance. The unfortunate contretemps of the Rubber Research Association may have given rise to the impression that there was some doubt concerning the value of the money spent in co-operative research.

Co-operative research carries us a long way from the business methods of our grandfathers and even of our fathers. Secrecy, and experimentation behind locked doors, was the rule in those days. We recollect, as recently as 1915, being handed a carefully prepared tube by the managing director of a firm with whom we were then associated, and being told to perform a certain experiment upon it, but under the strict command that " there must be no curiosity regarding the contents of the tube! " The re-grouping of industry which is so prominent a feature of our generation has put the final closure upon the absurd methods of our predecessors. It is true that there is still secrecy, but much of it is unavoidable, and little of it is important.

Pooling Resources

TO-DAY, firms that are normally in competition realise that there are certain fundamental difficulties connected with their business or trade to which none of them possesses a key. It is better that they should pool their resources in order to be able to undertake adequate investigation, than that they should continue in ignorance and in so doing possibly fall behind their foreign competitors. It is work of this character that is being sponsored by the Department of Scientific and Industrial Research.

Co-operative research, again, is the only method by which the smaller firms can engage in any form of serious major investigation. There are, even to-day, firms in the chemical industry that have no chemist. There are many other firms that would find a chemist of immense value, but have not one. We cannot resist feeling that one of the problems to which the D.S.I.R. might turn its attention is that of persuading concerns to whom scientific assistance would be useful to add such a man to their staffs and to give him adequate facilities for work. In that way one of the objects of the Department would be more readily achieved; we refer to greater support for research organisations. We are convinced that once chemists and physicists are employed by a firm, the organisation will soon begin to realise the value of scientific work, and, if the men engaged are the right type, they will then realise that it is both a duty and in their best interests to support the appropriate research association. Larger concerns, of course, will feel the benefit of the Association more readily; only those who have undertaken research work know fully the value of interchange of ideas, and the amount of time that can be saved by elimination of false trails through pooling of ideas and experiment.

Plans for the Future

WE have long held these views and have expressed them upon more than one occasion. It is therefore with special pleasure that we have observed that the representative conference referred to has endorsed the value of the Associations. It is singularly important that all should recognise, as they did, the importance of planning ahead. These organisations should be bound by no narrow vision of the problems of to-day or of next week. The staff should not feel that failure to solve a problem a difficulty or that cannot well be appreciated by the business man, is likely to react disadvantageously (or even disastrously) upon their future employment. The purpose of these bodies is to study the problems that have proved too hard for the individual or that are so far in the future that the individual concerns do not feel it encumbent upon them to tackle them. It is cheering to hear that the work is likely to be greatly enlarged and that far larger funds will be available in the future. We heartily endorse the Lord President's suggestion that each Association should draw up plans for the future, so that the Department could assist greatly to increase the scale of the operations.

A Word of Warning

IN taking this view, however, we are constrained to utter a word of warning. There is a disposition in some quarters to mistake the functions of the associations. A research association exists for the purpose of extending the boundaries of knowledge, and outside those boundaries individual firms are justified in putting their probems up for consideration. We would insist, however, that research associations should not be considered in the light of consultants, to whom appeal can be made for information upon known matters. Research results, whether general or conducted upon specific problems, should be open to all. It is quite justifiable to consult the research body upon plant or processes developed by itself; but it is not any part of the function of the research association to advise upon daily problems. That is the function of the works staff, or of the consulting chemist or engineer. We are led to make this distinction by the recent reported remarks of a gentleman occupying a high position. Speaking at a recent meeting he advised his hearers in these words: " If information and guidance upon purely technical matters was needed, no one could do better than collaborate with the Fuel Research Board." It is neither fair to the consultants—who have their living to make—nor to the research associations, to expect the latter to give free advice to individual firms upon private problems. Only matters that affect, or may affect, the industry as a whole should be tackled by the research associations as now constituted.

Annual Meeting of the Chemical Engineering Group

Lord Rutherford on the Trend of Modern Physics

THE annual meeting and dinner of the Chemical Engineering Group was held at the Waldorf Hotel, London, on April 27. Mr. W. A. S. Calder, of the Society of Chemical Industry, chairman of the Group, was in the chair at both functions.

The report recorded a slight fall in membership to 434 as against 448 in 1932. The highest figure ever reached was 486 in 1930. The policy of holding joint meetings with other bodies had been continued and developed during the year with great success. The accounts showed a healthy financial position. The committee recorded its appreciation of the services of the assistant secretary, Mr. C. J. T. Mackie, and his staff throughout the year.

Election of Officers

Officers elected for the ensuing year were: Chairman, Dr. W. R. Ormandy; hon. secretary, Mr. J. M. Leonard; hon. treasurer, Mr. F. A. Greene. Members of the general committee elected to fill vacancies were Mr. W. A. S. Calder, Mr. M. B. Donald, Mr. Donald McDonald, Mr. B. A. Smith, and Mr. D. M. Wilson. Mr. Calder referred, with regret, to the necessity for Mr. Donald McDonald to have to resign from the hon. secretaryship owing to ill-health and a cordial vote of thanks was passed to him for his services. Thanks were also accorded to the retiring members of the committee, Messrs. Tungay, Potter, Robson, and Ure.

Lord Rutherford was the principal guest at the annual dinner, and others present were: Dr. J. T. Dunn, president of the Society of Chemical Industry; Sir Alexander Gibb; Mr. Emile Mond; Sir Frank Smith, secretary of the Department of Scientific and Industrial Research; Sir Christopher Clayton; Mr. George Gray; Mr. F. A. Greene; Dr. H. Levinstein; Mr. William Macnab, president of the Institution of Chemical Engineers; Dr. L. A. Jordan, director of the Paint and Varnish Research Association; Dr. F. H. Carr; Dr. H. Moore, president of the Institute of Metals; Mr. J. Davidson Pratt, general manager of the Association of British Chemical Manufacturers; and Mr. C. F. Mounsdon, president of the Diesel Engine Users' Association.

Changes in the Past 30 Years

Lord RUTHERFORD, in an address on "Trends in Modern Physics," said, that during the past 30 years we had had more changes in Government and more changes in social order than had occurred since the period of Queen Elizabeth, or even the Norman Conquest. The minds of men were reacting to a number of forces and suggestions, the reasons for which they hardly knew, and there was a sort of reaction, almost like an auto-catalytic reaction, which gained speed and might get out of control, as had already been seen in one or two cases in Europe alone. At the same time, we were witnessing in America the reaction which was in full progress and indeed was accelerating, and we could only watch with hope and some fear what would be the end of that experiment, and whether it would arrive at a stable end, as everybody would hope.

Referring to some of the changes that had taken place within recent memory, Lord Rutherford commented upon the enormous advances in the chemical industry and the electrical engineering industry, broadcasting, and automatic machinery. They were all the result of scientific investigation, in the broad sense, and of the applications of science to industry in its manifold ways. The number of men engaged in pure research problems to-day could be multiplied by ten, twenty, and possibly even fifty, as compared with fifty years ago, but he was not at all sure that we fully appreciated what had been the effect of human thought, as well as the indirect effect in certain industries of that cumulative and offensive attack of science to understand nature. Unless a breakdown occurred in our social order—which was always possible—leading to a lower scale of living, it seemed inevitable that the rapidity of scientific discovery and advance would increase. It was to be hoped, for the benefit of our children and grandchildren, that the final result would be a stable product and not merely a temporarily stable one.

Industry depended on the proper application of science but the greater part of our industries were only half awake to this fact; indeed, some of them were almost still asleep and it must be realised, especially in this era of economic nationalism, which showed no signs of diminution but rather an increase, that there was going to be a keen and severe struggle for trade throughout the world, and there was not the least doubt that the nation which had a strong and well balanced scientific background would have the advantage. When speaking of such a scientific background, he was not referring merely to the research associations or institutions, but also to the large organisations such as existed in Imperial Chemical Industries, Ltd., and in other large undertakings. It was more than ever important that we should have a scientifically minded industry, *i.e.*, that those who managed industry, even if they were not scientific experts should, at any rate, be scientifically minded.

More Money for Research

The Department of Scientific and Industrial Research was playing its part in this connection, and the Government had supported the work of the Department for the coming year by granting extra funds in order that the work of the research associations might be broadened, especially in those cases of scattered industries which were operating in such small units that they could not deal with their own research work individually. In this way he hoped that it would be possible, given time, for the Department to bring the industries of the country into such a position that they could stand against the competition which was inevitably coming upon us and which would increase in the next few years.

Sir ALEXANDER GIBB, proposing the "Society of Chemical Industry," said he recently received a letter from one closely connected with the Society, in which there was a brief reference to the start of the Chemical Engineering Group, itself in turn the father of the Institution of Chemical Engineers. It put a point of view that chemical engineers themselves, perhaps, did not see and it was so good that it was worth quoting:—"Fifteen years ago chemical engineers began to clamour for self-expression—they looked to the mother body—the Society—for assistance, and with wisdom, not unaccompanied by misgivings, the rather prickly fledgling was nestled and eventually became the Chemical Engineering Group. The ugly duckling of 1919 now vigorously and gracefully leads an increasing brood of cygnets typified by the Food Group, Plastics Group, Roads and Building Materials Group, while there are rumours of others already chipping their shells. Each of these might, under other circumstances, have begun a calamitous life of struggling half-efficiency and would inevitably have, to some extent, hastened disintegration of the chemical social structure."

Benefits to Industry

Dr. J. T. DUNN, president of the Society of Chemical Industry, responding to the toast, said the Society was the only society which touched chemical industry and provided for the needs of chemical industry on all sides. Some people were inclined to think that the formation of Groups, such as the Chemical Engineering Group, and other Groups, might tend to the disintegration of the Society, but personally he had no fears on that ground. One of the great services which the Society of Chemical Industry rendered to chemical industry and the world in general, was the publication of its Abstracts, giving a resume of the scientific work that was being done all over the world. Having regard to the nature of this work, it had always seemed to him a little unfair that the financial strain involved should entirely fall on the members of the Society, who, as individuals, did not, perhaps, receive so much benefit from it as did the great chemical and other industries of the country.

The toast of "Our Guests" was proposed by Dr. W. R. ORMANDY, and was responded to by Mr. W. MACNAB.

The final toast of "The Chairman" was proposed by Mr. J. ARTHUR REAVELL.

Letters to the Editor

The Editor welcomes expressions of opinion and fact from responsible persons for publication in these columns. Signed letters are, of course, preferred, but where a desire for anonymity is indicated this will invariably be respected. From time to time letters containing useful ideas and suggestions have been received, signed with a nom-de-plume and giving no information as to their origin. Correspondence cannot be published in THE CHEMICAL AGE unless its authorship is revealed to the Editor.

Training for Higher Management

SIR,—In THE CHEMICAL AGE of March 31 you invite a discussion upon training for higher management of business. Let it be said at once, and very definitely, that there can be no such thing as a statutory qualification for directors and managing executives, without which no one would be allowed to practise. Any such scheme would at once result in preventing the rise of a new and small business to the stature of a large one. Like great scientific discoveries, a new business results from the development of just one "happy thought"—usually from the brain of a natural captain of industry. The maker of a new business will make it—with or without academic qualification. The problem resolves itself into the question of what course of training should be pursued by those who are now occupying junior or intermediate "commercial" posts, or intermediate or senior technical posts and who wish to become competent to occupy, to great advantage, higher executive posts, with a view to becoming directors of limited companies, or concerns of similar status, working with borrowed capital. The size of the concern doesn't matter so much. Once you get beyond the single shop, the problems are very much the same for the £50,000 or the £50,000,000 business. The problems concern fundamental principles rather than details.

Before commencing to teach business management, we must select the candidate. He may have had either a university education in the arts or sciences or an elementary school education. He must be possessed of the right character, be of suitable temperament, and have had his intelligence well developed. Passing our standard for these three qualities, he will be one, not both, of two natures, either the creative kind, the adventurer and leader of men, or the administrator, the staff officer, the man who makes the arrangements perfect for carrying into effect the great idea or the scheme of battle. Admittedly, the demarcation is not sharp and abrupt. Frequently the staff officer has some of the qualities of the great general, but generally, a man has one of these natures well developed at the expense of the other. In business, as in politics and war, both types of man are wanted. Our trouble is to see that they are correctly partnered.

The candidate will surely, except in rare cases, have been in some sort of occupation when he decides that he would like to go in for higher executive work, or management. He may have started as a chemist or a salesman, or even as a politician. However, at some time between the ages of 25 and 45 he should attend one of the centres running classes in industrial administration, either part-time or full. Gaining a diploma does not matter much. There are such centres in London and in the provinces. He should choose a school that recognises industry as being human and subject to the benefits and hindrances of the good and bad in human nature, not to be treated in a theoretical academic manner. The various industries have their mainsprings in men who are technicians of some sort or other—chemists, engineers, lawyers and accountants.

These men have had specialised educations. The business school must not attempt to take the student half way, or less, along the path which has been followed by the specialist. The business school must teach, not the detail, but the nature of the specialist's work, so that the business manager may understand the outlook, the difficulties and the limitations of the specialist technicians. On the other hand, certain subjects are themselves tools of industry and the student must be taught how to use them. I suggest that the higher executive would be all the better for some knowledge of industrial history; social and political economy; money and monetary systems; statistical method; industrial law and legal methods; physical and economic geography; two foreign languages; the siting, selection and management of buildings and plant; the selection and management of personnel; company law and finance; book-keeping and cost accounting; salesmanship and sales managership; merchandising and market research.

The student does not need to reach a professorial standard in subjects such as these. He requires to be taught the fundamentals, the potentialities. It is surprising, even to a (more or less) successful man in the middle thirties, what an astonishing amount of useful principles can be taught. As one who has been, incompletely, through a part-time course (in London), I can say quite definitely that industrial administration is a subject for teaching just as chemistry and physics are. Do not let it be suggested for a moment that every student with a diploma will make a good manager. Without the three qualities mentioned at the opening, he will be useless.

For the executive who is too old (let us be kind!) to attend evening classes, there are many societies covering the whole field of business. I will mention a few, and I hope the secretaries of those not mentioned will write to you and make good its omissions. There are the Institute of Industrial Administration, the Business Research and Management Association, the Management Library, the Works Management Association, the Office Management Association, and the Industrial Purchasing Officers' Association. All these hold monthly meetings in London. Some have provincial branches. Every post graduate business student and every technician and commercial man ought to belong to at least one.

The student or candidate for the higher executive post should interest himself in some local activity. He should serve on some committee, sports club, political or local government association. He will find such service will develop his faculty for dealing with and leading men and women of diverse station and character. It will enhance his "mixability" and teach him that his own business, however big, is only a small star in a big universe.—Yours faithfully,

"ANONYMOUS."

Watch Coal and Rubber

SIR,—The Government's decision to continue its aid for industrial research and to stimulate the search for oil fields in this country makes welcome news. No one can doubt the future prosperity of either the manufacturing or raw material producing industries of this country and the Empire, provided our resources are intelligently developed with foresight and prompt adaptability to future changes in market demands. So far as British manufacturers are concerned, immense progress has been made in this respect during recent years, as successive British Industries Fairs have clearly demonstrated. It remains to concentrate more attention upon the Empire's raw material resources, and in particular to study markets where we hope to make sales.

In this regard it is especially heartening to notice what is being done by industrial research and intelligent planning for those two vital Empire commodities, coal and rubber. The production of smokeless fuel and oil from coal is giving new life to an industry which many authorities quite recently thought to be on the danger list. The development of a recent product of the Empire's rubber plantations, cellular latex, is apparently revolutionising modern methods of upholstery, and opening up an immense new field for another Empire industry which, quite recently, was thought to be in a precarious state. To anyone who questions either the value of industrial research or of the Empire's potential resources, may I be permitted to say: "Keep your eye upon coal and rubber during the next few years!"—Yours faithfully,

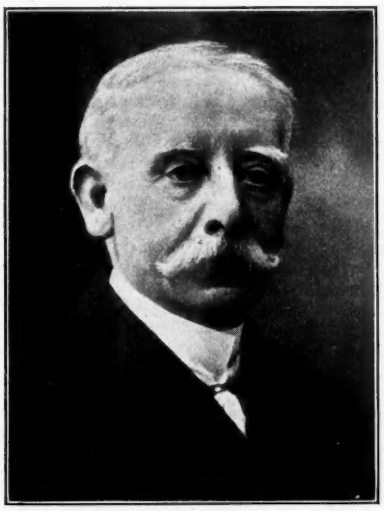
IRENE WARD (M.P.).

Wallsend-on-Tyne.

Death of Mr. W. George Whiffen

Sixty-Seven Years in the Fine Chemical Industry

THE death of Mr. William George Whiffen, F.I.C., J.P., on April 28, following an operation at the Wimbledon Hospital, of which he had been a trustee since 1908 and chairman since 1916, will cause widespread regret amongst a large and influential circle of friends by whom he was greatly esteemed and respected on account of his many activities in business, social and public services. Mr. Whiffen, who was in his 83rd year, was chairman of Whiffen and Sons, Ltd., manufacturing chemists, of the Aldersgate Chemical Works, Carnwath Road, Fulham, and had been associated with the firm for over 67 years. He was also a director of Marshall Sons and Co., Ltd., Gainsborough, and many other companies. His advice and counsel will be greatly missed by the board of Whiffen and Sons, Ltd., and every member of the staff is conscious of having lost a valued friend. By his unvarying courtesy and kindness to the firm's employees, Mr. Whiffen had endeared himself to all.



The Late Mr. W. G. Whiffen.

He will be remembered as one of the original Fellows of the Institute of Chemistry, founded in 1877. He was one of the few recently presented with the gold medal of original fellowship. The Whiffen Laboratory at the Imperial College of Science was the gift of Mr. Whiffen in the year 1921. He gave it with the object of offering an incentive to young students to study the factory side of the industry in addition to the purely theoretical.

On account of his long and varied experience in the fine chemical industry he had been for some years past justly regarded by the British manufacturers as the doyen in this particular branch, and his intimate association with the principals of many leading Continental firms of similar character frequently necessitated his travelling on the Continent within the last few months. His participation in public affairs was varied and widespread, the care and support of hospitals always being one of his main interests. For the past sixteen years, he had been chairman of the Wimbledon Hospital and he was largely instrumental in bringing it up to its present state of efficiency by the addition of a nurses' hostel and a children's wing. His memory will be borne in grateful recollection by the aged occupants of the Wimbledon almshouses, as he did much for their comfort and well-being. He was a member of the committee of the Haygarth Home and of the John Evelyn Club. As a governor and active member of many committees of the London Hospital, he will be remembered by officials and patients of that institution. Mr. Whiffen was also on the committees of St. George's Hospital and Queen Charlotte's Maternity Hospital.

One of his greatest joys in life was Wimbledon Common, and, as a conservator, he spent much time and took the utmost pleasure in organising and supervising the work of the common keepers. He was instrumental in the scheme for the original extension before the war of the Wimbledon and Putney Commons, which scheme was ultimately absorbed in the War Memorial. He was greatly interested in the Surrey Playing Fields Association. The completion of the beautiful Richardson Evans Memorial Fields in Kingston Vale under his chairmanship has proved of the greatest benefit to many local athletic clubs. More recently he has given of his great experience in the development of the new playing fields at Merton in memory of the late Sir Joseph Hood.

Mr. Whiffen's horse carriage and liveried coachman were familiar sights in Wimbledon and Fulham. He was attached to his brougham rather than prejudiced against motor-cars, and occasionally took a technical interest in the motor as in other modern developments. In spite of occasional drives in motor-cars, however, he was always credited with an intense dislike of the automobile. His interest in the open spaces and playing fields movement was maintained to the last. He was one of a committee of five who were selected to plan the Memorial Garden in Kingston Vale and the erection of the Memorial Cross, a happy, restful idea which was carried out with exquisite taste. He was the last survivor of the committee, the other members of which were Mr. Richardson Evans, Mr. Extone, Mr. W. J. Jeaves, K.C., and Mr. L. R. W. Forrest.

He had been a Justice of the Peace for Surrey since 1926 and in this capacity he took special interest in the work of the juvenile court, and in his official visits to Wandsworth Prison.

An intimate friends writes: "It was his simple Christian faith that carried him through all the difficulties of life, and his devotion to religion was shown in all his philanthropic activities and his regular attendance at the little church in Kingston Vale, where he was a worshipper for over 25 years. All will miss his quiet presence."

The funeral was in Putney Vale Cemetery on Wednesday after a service at Robin Hood Church, Kingston Vale.

Spreading a Knowledge of Science

British Science Guild Effort

AN effort to extend a knowledge of the latest developments in science among leaders of the professions, politics, art and industry, has been inaugurated by the British Science Guild. By arrangement with the Royal Institution, the Guild has organised a series of lectures in the theatre of the Royal Institution on certain Wednesdays throughout the year. The first lecture was delivered on May 2 by Sir William Bragg, on "The Development of the Principles of Refrigeration." The second will be given on May 30, when Lord Rutherford will lecture on "Hellium and Other Rare Gases."

It is hoped that the lectures will awaken interest among all who, while their own time is fully occupied with other pursuits, are yet anxious to follow the main trend of scientific progress. By bringing together notable men of every calling, the lectures will help to purvey scientific knowledge by direct method to those best able to put it to immediate or eventual effect in every sphere of life. Among those who accepted invitations to attend the first lecture were Lord Amulree, Lord Bethell, Lord Balfour of Burleigh, Lord Burghley, Mr. J. C. C. Davidson, Sir John Reith, Lord Gainford, Sir Aylmer Hunter Weston, Lord Illiffe, Sir Harry McGowan, Sir Henry Lyon, Sir Philip Nash, Lord Dalkeith, Mr. Robin d'Erlanger and Lord Derby.

THE Japan Oil Co. with three carbon black plants operating near the Kinsui field, manufactured during the first eleven months of 1933 about 1,200,658 kg. of carbon black, all of which was exported to Japan. The three plants are manufacturing the pigment by the Channel process, and their combined capacity is between 3,600 to 4,000 kg. a day.

Steam in Chemical Works

Economic Generation and the Factors Involved

Two papers of outstanding merit concerning steam in chemical works were presented at a joint meeting of the Institution of Chemical Engineers with the Institute of Fuel and the Chemical Engineering Group, held at the Chemical Society's Rooms, Burlington House, London, on April 18. In the first paper, Mr. F. H. Preece, A.M.Inst.C.E., A.M.I.E.E., and Mr. B. Samuels, M.I.Mech.E., dealt with the economic generation of steam; the second paper, by Mr. W. F. Carey, M.Eng., and Mr. A. H. Waring, A.M.I.Mech.E., covered the economic use of steam.

The introductory remarks of the authors of the first paper were devoted to a brief survey of the progress which has been made in the generation of steam, one of the most remarkable achievements having been a notable increase in steam pressures from 200 lb. per sq. in. in 1912 to 1,100 lb. per sq. in. in 1930. While working pressures have been steadily advancing, however, the same has occurred with the temperature of the steam. This has gradually increased from a total temperature of 550° F. to temperatures of 700 to 800° F., and there are cases where, with a working pressure of 1,850 lb. per sq. in., the temperature of the steam is raised to 930° F. and even higher temperatures have been employed experimentally. The thermal efficiency obtainable from a steam-raising plant leaves little margin for further improvement in this direction. In reality this has been the position for some 25 years, during which period efficiencies of 86 to 88 per cent. on the gross calorific value have been recorded, which is equivalent to about 90 to 92 per cent. on the net calorific value. Development has instead been in the direction of obtaining or approaching these figures with cheaper grades of fuel, with reduced maintenance charges, and with the higher feed water temperatures frequently provided on modern plants.

Lower Grades of Fuel

Dealing first with the lower grades of fuel, there has been a demand for some years to burn on steam-raising plant dirtier and finer coals and coals containing less volatile matter. This has been met by the introduction of new designs of chain grate stokers with forced draught, which is controlled separately for different sections of the stoker by the provision of compartments. A further development in the burning of cheap fuels has been the successful handling of coke breeze. This has actually been burned on chain grate stokers for practically 20 years, but the advance during the last two years has been considerable in the direction of improving the flexibility of the firing and broadening the grading of the breeze which can be burnt.

Now that such progress has been made in dealing with low grade fuels, a new development has occurred in the preparation of coal for steam raising, according to which the manufacturers are called upon to deal with very clean coals instead of dirty ones. At the moment it seems that this development is going too far, because with the very low percentage of ash now left in some coals, of the order of 3 per cent. to 5 per cent., there is a great danger of high maintenance of the grate. This affects all types of stokers or grates to a greater or less extent, but there are available chain grate stokers with thin links and fine air spacing, which stand up to severe conditions better than the older designs having thicker masses of metal.

Ash Content

In one or two cases where the user has had experience of the disadvantage of burning these extremely clean fuels, it has been possible to arrange with the colliery company for sufficient ash to be left in the fuel to protect the bars. Alternatively, in other cases, ash is actually mixed with the coal delivered to the stokers, for the same purpose.

Until the last four or five years an important item of maintenance has been the furnace refractories, particularly the combustion arch, and this has become more acute with the increased rates of combustion necessary for modern conditions. A very considerable improvement has been effected by the elimination of the combustion arch, where sufficient height is available to permit of this. Such an advance has only been rendered possible by the introduction of pulverised fuel with the very tall furnaces which are essential for this method of firing. This paved the way for the use of high furnaces with stoker firing. Whilst not essential, such an arrangement, under certain conditions, constitutes an advantage and justifies the additional cost involved. A further reduction of maintenance of the furnace refractories has been effected by water cooling the walls, the necessary tubes being connected up to the circulation system of the boiler.

The introduction of the tall so-called archless furnace, combined with water cooled furnace walls, has materially increased the combustion capacity of modern stokers, and enables higher ratings to be obtained from individual boilers than was possible before their introduction. With furnaces having the refractory combustion arch, the maximum rating practicable was in the order of 40 lb. per sq. ft. of grate surface. With these modern furnaces a combustion rate of 80 lb. per sq. ft. has been easily maintained without any indication of forcing.

Feed Water Heating

Modern developments have also included the introduction of feed water heating, so that the water delivered to the boiler unit is frequently at such a high temperature as to render impossible a sufficient reduction of the gas temperature by the use of an economiser only; feed temperatures are now employed up to 350° F. It will be seen, therefore, that to obtain the low final gas temperatures necessary for high efficiency, say, 240° to 270° F., some cooler medium has to be employed for absorbing the heat from the flue gases. This is the only real justification for the adoption of the air-heater, which is now somewhat extensively used. It has been suggested that the hotter combustion air supply improves the efficiency of combustion, but this is definitely not the experience of the authors, with one or two unique exceptions of particular fuels (not coal), which are not met with in this country. In view of this it will be appreciated that if the feed water temperature is low enough to permit of the use of an economiser, it is preferable that this should be employed rather than an air-heater.

Coming to gas as an alternative to solid fuel, it will be found that the majority of cases are for gas from coke ovens, having a calorific value of approximately 500 B.Th.U. In burning these gases the modern tendency is to install burners of the design whereby the gas and the air necessary for combustion are split up into separate streams, each arranged so that close intermixture of the air and gas can be obtained at the mouth of the burner.

Utilisation of Waste Heat

Steam can also be supplemented in many works by the utilisation of waste heat from furnaces. Since 1917 considerable advances have been made in this direction. For very many years boilers were fitted to re-heating furnaces, and others of the non-regenerative type, where the gases were at a temperature of 1,700° to 1,800° F., but it was not until about the date mentioned above that serious consideration was given to the utilisation of the waste heat from regenerative furnaces where the temperature of the gases varied from 900° F. to 1,300° F. owing to the difficulty in obtaining the necessary draught to draw the gases through the regenerators, this requiring approximately 1¼ in. to 1½ in. w.g. at the furnace outlet. However, more extensive use of induced draught overcame this trouble, when it was realised that an increase in velocity of the gases over the boiler heating surface gave considerably higher heat transfer, and it was possible to obtain a larger recuperation of heat in the form of steam by these means, with gases even down now to as low a temperature as 750° F., which occurs in the case of gases leaving rotary cement kilns.

To summarise the foregoing it may be said that progress has been made in the direction of higher pressures, higher superheat, increased evaporation per sq. ft. of ground space and the use of lower-grade fuels. A further development has been to centralise the boiler plant, and thereby distribute steam at the required varying pressure throughout the factory or works, with reduction in labour costs, etc.

Centralisation is becoming more general, especially in factories in which steam for process work is the main object, but where a considerable amount of electrical power is also required. Perhaps the greatest advantage of high pressure steam is that it can be readily converted into electrical energy, being passed through a turbine in such a way that the exhaust pressure is the pressure required for heating and process. The management, in considering a works layout, have therefore before them the choice of: (a) Purchasing electricity for power and light, whilst generating steam for process and for heating purposes generally; or (b) generating steam for process and producing electricity as a by-product.

Need for Complete Records

The present-day practice in an up-to-date boiler-house demands a complete record of the utilisation of the heat delivered from the coal, and, therefore, every boiler unit should be equipped with a complete set of indicating and recording instruments. The fundamental information required would be:—

(A) Heat utilised in the boiler plant determined from—
  (i) Quantity of steam generated.
  (ii) Steam pressure and temperature.
  (iii) Temperature of feed water.

(B) Heat energy supplied to furnace determined from—
  (i) Quantity of fuel consumed.
  (ii) Calorific value of the fuel.

(C) Conditions of the fire and cleanliness of the heat transferring surfaces.

These are indicated or controlled by—
  (i) Intensity of draught, which influences the quantity of steam generated and the efficiency of combustion.
  (ii) Temperature of the in-flowing air.
  (iii) Temperature of the flue gases at the boiler outlet or at the economiser and air-heater outlet, where these accessories are installed.
  (iv) Percentage of CO_2 in flue gases.

A panel is placed close to each boiler with suitable instruments mounted thereon to give the above readings, with the exception of those under item (B). Item (B) (i) can be obtained from a weigher, preferably placed on the discharge chute from the bunkers, or a less expensive appliance which is either fitted to the coal chute or worked from the chain grate stoker. Item (B) (ii) can be checked by the chemical engineering department of the factory which generally forms a standard portion of the staff. Records should be kept throughout the day and a summary made weekly.

Minor Adjustments

To-day every plant is designed to obtain the maximum efficiency, and in boiler house design work the calculations are based on practical experience. As no two boilers work under exactly the same conditions in any two separate places certain adjustments may have to be made when the units are put into operation, but so closely are the conditions known to-day that it is possible to give the exact performance at the various points throughout the installation.

There are, for instance, various points at which it will pay from the question of efficiency to bring an additional unit into service, instead of working one or more units at overload. If the first boiler is worked at more than 20 per cent. overload, the efficiency will drop very rapidly, and it is then better to run two boilers at light load, rather than persist in running the one boiler at the heavy overload. In addition, maintenance would also be increasing as the load is increasing.

In general, feed water consists of a quantity of condensed steam, the remainder being make-up water, the combination being used as boiler feed. The classes of plant can be considered in two categories. Where all the steam is used for turbines there would be approximately 95 per cent. condensate and 5 per cent. make up. Alternatively, where all, or a portion, of the steam is used for process work, the condensate may be from nothing up to 95 per cent. of the total feed and the remainder make-up water.

When make-up water is in the neighbourhood of 5 per cent. it is generally economical to use evaporators which, when correctly worked, would give the purest water, and for high rated and high pressure plants, *i.e.*, pressures above 600 lb., it is almost essential to use evaporators for obtaining the make-up water. When the quantity of make-up water is a very considerable proportion of the total feed, it is too costly to use evaporators, and therefore the water is usually treated chemically, in the standard form of lime-soda softener with suitable conditioning. When the water contains magnesium salts it is beneficial to use sodium aluminate with the lime and soda in the softener, which enable the hardness to be reduced to lower figures than when lime and soda only are used. For most waters it is advisable in any case to use hot treatment. Further, conditioning is carried out by the use of tri-sodium phosphate, which renders any scale forming matter more flocculent and prevents hard scale forming in the boiler, and considerable benefits are usually obtained in this way.

Another point that has to receive special attention is in connection with rendering the water in a state to prevent any possible chemical embrittlement of the boiler plates. Although the majority of waters in this country contain a large amount of sodium sulphate, there are frequently cases where the amount of sodium sulphate is insufficient, and it is necessary to add sodium sulphate to obtain the correct ratio of sodium sulphate to alkalinity to inhibit the effect of the caustic which might cause embrittlement of the steel boiler plates.

Condensate from Turbines

Condensate from turbines is usually very pure water, but inclined to be on the acid side, and therefore care has to be taken that the resultant mixture with the make-up water is such that the total feed has always a slight but definite caustic soda alkalinity. This is usually not difficult to obtain in the normal way when the make-up water is chemically treated, but when the make-up water is from evaporators then subsequent chemical conditioning of the condensate and evaporated water has to be carried out to give to the total feed this definite alkalinity. Care must also be taken to see that in plants where the condensate is from process work no contamination occurs, and it is equally important to watch for leaky condensers.

For high pressure plants it is essential to install de-aerators (if this is not already carried in the condensers) to reduce the oxygen content to a minimum. Further, where there is oil contamination that cannot be eliminated at the source, the water has to be treated chemically in de-oilers after the main quantity of the oil has been separated mechanically.

The control of the water in the boiler itself is mainly a question of seeing that the total solids do not concentrate beyond certain limits, depending on the rate of working and the pressure of the plant, and in certain circumstances a continuous blow-down connection may require to be fitted to the boilers and the heat recovered, and under all circumstances it is advisable to lead the blow-down water to waste.

Points from the Discussion

Dr. R. LESSING suggested that the authors were not justified in their statement that the development in regard to the use of very clean coals on stokers was going too far. He urged that the difficulties which arose when truly clean coals were being burned in stoker-fired boilers should be regarded as being, to all intents and purposes, parallel with the difficulties which had arisen years ago as the result of developments on the steam side. As the economic advantages of high-pressure steam came to be realised it had obviously become necessary to construct the boiler in a different manner and of different materials, and the engineers and boiler makers had taken the trouble to do that. The use of very low ash coals demanded exactly similar developments; therefore, it was up to the engineers and metallurgists to provide materials which would meet the newly-established requirements and so avoid the troubles experienced, and which undoubtedly were caused by the growth and burning of grate links. This problem of burning was not a problem of *quantity* of ash contained in the coals used, but of the *kind* of ash.

In regard to the dust content of coal, continued Dr. Lessing, the same conditions applied. The natural dust in the coal had a different kind of ash, usually fusing at a lower temperature, from the ash in the massive portion of the coal. It seemed very important that the dust portion should be removed from the coal which had to be used in stoker-fired boilers. This was already being done in several instances, and in one particular case, that of a large power station where approximately 50 per cent. of the coal was fired on stokers and the other 50 per cent. was fired as powdered fuel, the advantages gained in combustion efficiency alone, as the result of firing practically dust-free coal, had been such that the de-dusting plant had practically paid for itself in less than a year. On ordinary stoker-fired plant, particularly when operating at high load and with high air velocities through the grate, a good deal of dust, which was always present in the coal unless it had been de-dusted, was taken up by the gases and carried out of the furnace practically without combustion, or with only a very small degree of combustion; so that what we were pleased to call carbon in the flue dust was really to be ascribed to this original dust in the coal and not to dust in the massive porton.

The Lancashire Boiler

Mr. A. R. WEBBER, though not directly interested in the Lancashire boiler, regarded it as unfortunate that that boiler was not mentioned in the paper, and said the modern developments of the internally-fired boiler were such as to make it a very formidable competitor of the water-tube boiler for those ranges of industrial steam requirements where the pressure and temperature limits were not entirely beyond it. Further, the allowance for depreciation made by the authors appeared to be 2 per cent. on the capital cost; that seemed a very low figure for industrial plant. The total interest charges, therefore, amounted to only 7 per cent., but he believed that most of those responsible for installing industrial plant, whether for steam raising or for any other purpose, were accustomed to put down a distinctly higher figure to cover their total interest charges.

Dr. F. M. H. TAYLOR gave the results of a test carried out on Lancashire type boilers, using coke, in a hospital installation. There were four Lancashire boilers, the dimensions of which were 30 ft. by 8 ft., with Meldrum forced draught furnaces, steam jet system. The grate area was 35 sq. ft. per boiler, and a Green's economiser was fitted. Two boilers were at work during the test, the duration of which was 168 hours, the total water evaporated being 777,580 lb. during the test. The average steam pressure was 120 lb. per sq. in.; the actual evaporation per lb. of fuel as fired was 10.12 lb.; equivalent evaporation, 11.21 lb.; average CO_2 reading 14.5 per cent.; and the efficiency of the boilers, plus economiser, was 83.5 per cent. Really high efficiencies could therefore be obtained with the hand-fired type of plant, and on much smaller boiler installations than those described in the paper.

Meeting New Conditions

Mr. SAMUELS, replying to Dr. Lessing, said it was true that the boiler makers had met the new conditions arising from increased steam pressure and temperature, increased output, and so on; but he did not think that the position there was analogous to what was happening in regard to coal. In respect of the use of increased steam pressures and temperatures there were definite conditions which it was unmistakably an advantage to meet, but he had not seen it proved that the same economic argument could correctly be applied to coal. An engineer concerned with an important installation in this country had discussed the matter of clean coal with the proprietor of the colliery from which it was obtained. As a result, by a modification of the method of handling the coal at the washery, there was produced a coal containing 8 per cent. of ash—much to the delight of the colliery proprietor because he obtained a better throughput from the washery, and also of the user because he obtained coal containing the percentage of ash which best suited his conditions. As to the combustion efficiency, the loss due to having 8 per cent. of ash instead of 4 per cent. in the coal was negligible, and there was no difficulty in getting as high a percentage of CO_2 when using coal containing 8 per cent. of ash as when using coal containing 4 per cent. of ash. He disagreed with the suggestion that the carbon in the flue dust must be ascribed to the original dust in the coal and not to the massive portion. He mentioned in this connection an installation where washed grained coal was burned and the carry-over was considerable, which confirmed that the larger pieces of coal became smaller on burning until they were small enough to be carried up into the boiler.

Mr. L. N. HORNE, whilst agreeing with Dr. Lessing that we must hang on to the idea of cleaning coal, also backed up the authors in saying that it was not a practicable proposition economically to expect to burn such clean coal on chain grate stokers used at the present time. He suggested, however, that one way of overcoming the difficulty was blending. If dry-cleaned smalls (containing about 12 per cent. of ash) were blended with washed nuts in the proportions of 3 of the smalls to 1 of washed nuts, the average ash content of the blend would be 9 per cent., and the blend would not do harm to the plant. If insufficient moisture from the washed nuts was absorbed by the smalls to give the necessary effect on the grate to assist combustion, moisture could be added. He also believed that it was better for the consumer rather than the colliery proprietor to do the blending, in view of the many varying requirements.

Mr. SAMUELS said it seemed to have been forgotten that washed coal had been burned for years, and the users had not been bothered with the very thorough cleaning that was being thrust upon them to-day. He was also disappointed that the colliery people considered that the man who was raising steam was not a sufficiently important customer to warrant meeting his requirements.

The second paper, by Mr. W. F. Carey and Mr. A. H. Waring, on the economic use of steam in chemical works will be given in a later issue of THE CHEMICAL AGE.

German Plant Exhibition

Over 3,000 Invitations Accepted

THE great interest aroused in all countries by the forthcoming Achema VII exhibition is indicated by the fact that up to the middle of April over 3,000 people notified their intention of being present; there is evidence that this number will be greatly exceeded. A feature of the exhibition (which is being held from May 18 to 27, on the occasion of the 47th annual general meeting of the Verein deutscher Chemiker) is the system of recording the names of intending visitors, whereby exhibitors and visitors from all countries are put into contact with each other. It is especially pleasing to note the large percentage of visitors from countries other than Germany.

The Achema VII will be an event of outstanding importance, and will fulfil all the expectations which are naturally associated with the "reconstruction" spirit of modern Germany. Well over 65,000 sq. ft. of exhibition space has been reserved by 300 leading German manufacturers of chemical plant and apparatus. Those registered as "intending visitors" receive gratis a copy of the "Achema Yearbook 1931-34," just published, containing a comprehensive survey of the Achema VII exhibition. In addition, registration secures a free entry ticket to the exhibition.

Notification of intention to visit the Achema VII should be sent to Dechema, Deutsche Gesellschaft für chemisches Apparatewesen E.V., Ausstellungsgelände Köln-Deutz). The Dechema, as is well known, has as its main object the co-ordination of the work of the chemist and the engineer and is the organisation responsible for the exhibition.

Prussiate Exports from Netherlands

EXPORTS of sodium ferrocyanide from the Netherlands during 1933 declined to 652 metric tons from 1,825 tons in 1932. Great Britain, the leading buyer, accounted for 273 tons, followed by the United States 202 tons, Spain 51 tons, and Italy 30 tons. The trend of potassium ferrocyanide shipments was upward, 1933 exports of 665 metric tons showing a gain of 125 tons over those of 1932. Chief destinations were Great Britain 175 tons, Belgium 74 tons, Germany 58 tons, France 55 tons, Poland 53 tons, and the United States 26 tons.

Experimental Rubber Compounding and Testing

Some Essential Equipment for the Laboratory

NOW that scientific methods are more generally adopted in the rubber industry, a well-equipped laboratory for experimental, testing and research purposes is necessary to control the quality and uniformity of the products, and to adapt products to specifications of customers and development of improved methods. In collaboration with several laboratories engaged in this work, A. Gallenkamp and Co., Ltd., have just finished the task of compiling a catalogue describing experimental rubber vulcanising equipment and rubber testing apparatus.

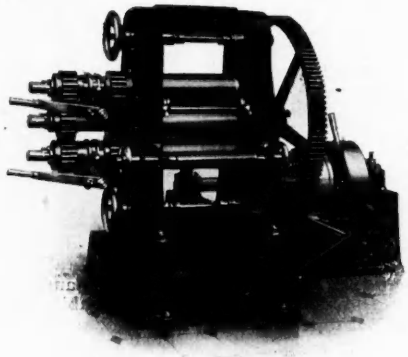


Fig. 1. Experimental Calender.

The experimental mixing mill is provided with rollers of special metal to prevent rust, steam and cold water connections, electric motor and various safety devices. The calender (Fig. 1) is an improved 3-roll type, fitted with chilled cast iron hollow rollers; in the ends of each is arranged a patent "Packingless" steam and drain connection for either steam heating or water cooling. The frames of the machine are of heavy box section cast iron, with all facings and register-

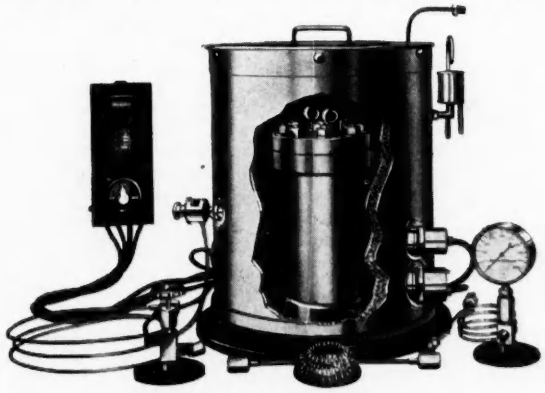


Fig. 2. Rubber Ageing Apparatus.

ing parts accurately machined to ensure perfect working. Bearings carrying the bowl ends are of cast iron with gun-metal liners. For adjusting the top and bottom bowl, a hand-operating gear is installed. The even and friction speeds are arranged by means of two sets of roller end wheels through sliding dogs, hand-lever controlled. The middle roller being driven through machine cut spur gearing from a short countershaft, which can receive its motive power from either a belt drive from friction clutch or alternatively direct coupled electric motor through a further reduction gear. Suitable batch-up and let-off gears arranged front and back of the calender. Suitable safety devices can easily be fitted to the machine, the operation of which can be either through the friction clutch or electric cut-out to the motor. The control of this being by means of a wire rope in a convenient position for the operator to strike when the necessity presents itself.

Among other necessary equipment are presses (hand and hydraulic), autoclaves, vulcanising pan (wet or dry steam, vertical or horizontal types), extruding machine (belt-driven or motor-driven) for the forcing of rods or tubes or the rubber covering of wire, washing mill (with cold water and steam

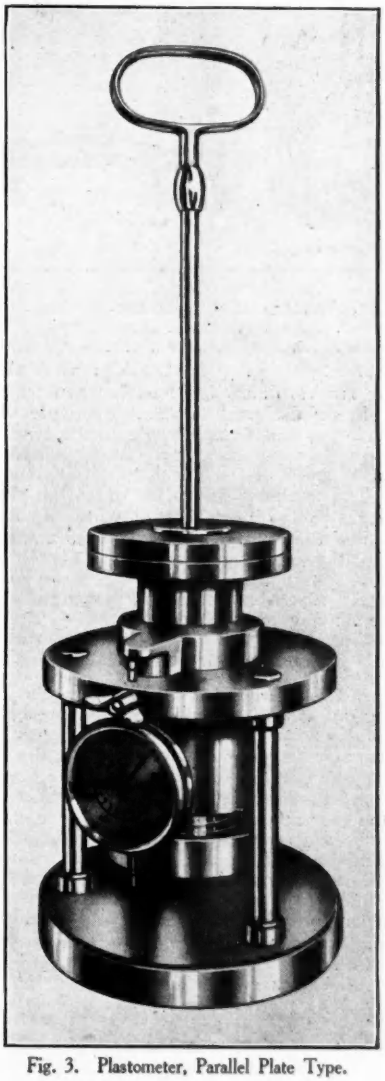


Fig. 3. Plastometer, Parallel Plate Type.

connections), spreading machine and solution mixing machine.

The selection of hygrometers and control outfits for maintaining constant temperature and humidity in the experimental rubber laboratory is an important matter. The humatograph (Fig. 4) is an inexpensive scientific instrument for determining with accuracy the amount of moisture present in any atmosphere. It utilises cone bracks, specially treated, which are very sensitive. The cone fibre is rigid and strong and is arranged to give a direct linear pull on an amplifying movement to the pointer. The instrument has been found to be very reliable, giving a very quick reading, accurate to 2 per cent.

Fig. 4. Humatograph.

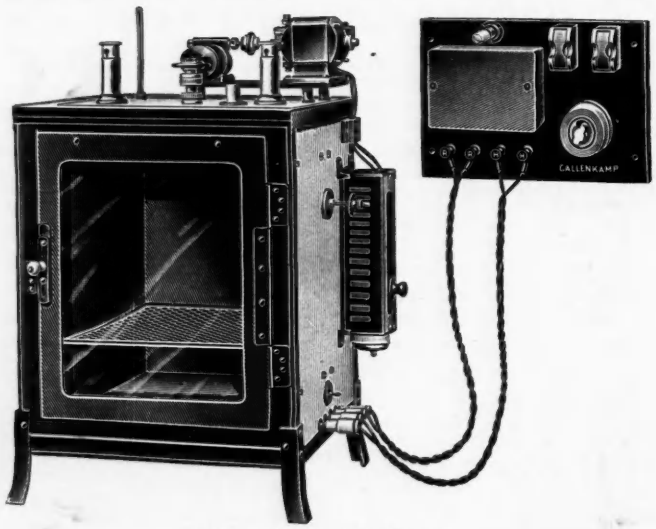


Fig. 5. Electric Ageing Oven.

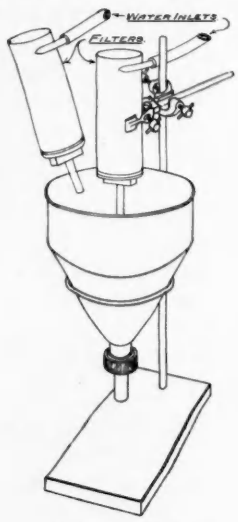


Fig. 6. Grit Tester.

In addition, the laboratory needs timing clocks and interval timers, tensile rubber testers and ring cutters, permanent set apparatus, hardness testers, and abrasion machines.

The plastometer (Fig. 3) is of the parallel plate type as designed by Ira Williams, but modified and improved. Although originally designed for testing unvulcanised rubber stocks, this instrument is applicable to all types of plastic materials. By compressing for a given time a rapid comparison can be made of the plasticity of different batches of materials. The test may be carried out at an elevated temperature, *e.g.*, 70° to 100° C., the whole apparatus being placed in the thermostatically-controlled air oven. The stem carrying the weight projects through the top of the oven, so that the weight (5 kg.) is outside. The essential parts are two accurately plane horizontal metal plates and a really good gauge reading to 1/100 mm.

The Ageing of Rubber

An interesting and valuable method of ageing rubber and the carrying out of ageing tests is now made possible by the use of the bomb apparatus (Fig. 2). Experimental work has produced convincing proof that oxidation is the chief factor in the ageing of rubber, but in view of the fact that some authorities are of the opinion that heat is also largely responsible, the new apparatus is so designed that one or both of these factors, or a combination of both, may be employed. Up-to-date methods of electric heating and control, the use of stainless steel, expert knowledge and experience in the design of high pressure apparatus, combine in the production of what is an up-to-date, safe and convenient apparatus of British manufacture. By its use, manufacturers have a satisfactory control of rubber goods in manufacture, the results conforming almost exactly to natural ageing and offering a reliable means of judging the ageing properties of rubber compounds.

The apparatus consists of a copper tank, thermally insulated and provided with thermostat and two immersion heaters (each 700 watt) with switch board. A stainless steel receptacle tank fits into base of copper tank. A safety valve with copper disc is fitted to cover, and connections to oxygen cylinder are provided. At 60° C. and a pressure of 300 lb. per sq. in. oxygen, the exposure of rubber samples for a period of 20 to 24 hours gives an ageing test comparable with an atmospheric ageing for two years. Increasing the temperature to 70° C. the rate is approximately doubled.

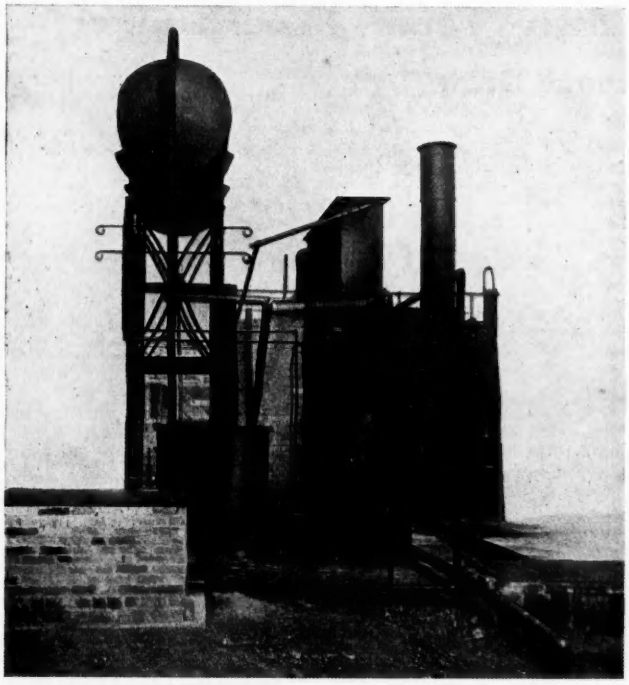
In the electric ageing oven (Fig. 5) the samples are suspended from a rotating shelf, while the temperature of the oven is maintained at 70° C. ± 0.5° C. The shelf rotates and can be regulated to suit conditions required. This ensures a uniform temperature as well as agitating the air within the oven. The oven can be fitted with horizontal revolving cage with reduction gearing at side and is also made for use up to 165° C. Fluorescent and durability tests necessitate powerful ultra-violet radiation by suitable mercury vapour lamps. Fading and ageing outfits, with special carbon arc lamps, are also obtainable.

The grit tester (Fig. 6) is of the Gallie-Porritt type, designed by the Research Association of British Rubber Manufacturers. It is used for the rapid and accurate separation of grit from powders, and is provided with three cups (100, 200 and 300 mesh). The distinctive feature of the method consists in suspending the powder under test in water and supplying by a jet of water under pressure, the mechanical force necessary to secure the passage of the fine particles through the sieve and the breaking down of any lumps.

This grit tester consists of a metal funnel terminating at the foot in a short cylindrical outlet in which is inserted a shallow, removable cup, on the bottom of which the wire gauze is mounted. The aperture is 25 mm. diameter and the gauze may be of any desired mesh. The water under pressure is supplied by a tube fitted with a nozzle designed to discharge a spreading jet through the sieve and the tube is so arranged that the position of the crifice in relation to the sieve can be adjusted without fear of piercing the gauze accidentally with the nozzle. The tube is provided with a filter to ensure the removal of any solid particles from the water. This filter must be made from a gauze at least as fine as that used for the separation of the grit from the material under test and must be of an area large enough to ensure a low velocity of flow to prevent undue loss of pressure. A second tube, connected by flexible tubing and a tap to the filtered side of the same water supply, is arranged to provide a gentle stream of water for wetting the powder, keeping the volume of the liquid in the funnel constant during the progress of the test, and washing down the funnel at the end of the test.

South Africa Locust Infestation

SOUTH AFRICA has recently passed through one of its worst periods of locust infestation, and to fight the pest large quantities of liquid poison were manufactured at Umbogintwini, where, while the pest was at its worst, work was carried on day and night. The arsenic and the treacle required for the poison were manufactured there and the supplies of poison then shipped direct to the areas where it was needed. At some of the depots there have been no less than 30,000 gallons of the poison in stock. This poison has been used effectively in many parts of the Transvaal and the Orange Free State, and also in Northern Cape.



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The Chemical Age Lawn Tennis Tournament

First Round Draw

ENTRIES for the fourth annual CHEMICAL AGE Lawn Tennis Tournament closed on Wednesday morning, and details of the draw for the first round are given below. We invite all who have been drawn to play matches in the first round to arrange their fixtures without delay, in accordance with the rules of the tournament. The closing date for the first round is Monday, June 4, but if all the results are received before that date it may be possible to expedite the second and subsequent rounds and thus to obviate inconvenience due to the holiday season.

There is every reason to anticipate a very interesting season, as a number of players who have participated in the tournament in previous years, including the cup winners of 1932 and 1933, are again competing, while the inclusion of several new players who have not been seen in the competition before lends fresh interest. We are again disappointed at the small number of entries from the provinces which prevents the division of the country into convenient areas for the playing off of the earlier rounds.

THE CHEMICAL AGE silver challenge cups, one for the doubles and one for the singles, will be awarded, to be held jointly for twelve months by the winners and the firms they represent, and there will also be, as in previous years, smaller trophies to be presented outright to the successful players and runners-up. The present holder of the singles cup is C. G. Copp, of Doulton and Co., Ltd., London, and the doubles cup is held by F. G. Hawley and J. Haines, of the Anglo-Persian Oil Co., Ltd., London.

Players are requested to read carefully the brief rules of the tournament, copies of which have been supplied to them, and adhere to them, as failure to do so may lead to disappointment. For ready reference the principal rules may be summarised as follows:

Summary of the Rules

The competition is conducted on the knock-out principle, and the best of three advantage sets are to be played in all matches, except in the final of the singles, when the best of five sets will be played. The Editor of THE CHEMICAL AGE has the right to scratch any players who fail to play off their matches by the stipulated dates, or who otherwise fail to conform with the rules and regulations.

Except in the case of the final, players drawn against each other must make their own arrangements for playing off their matches on a court mutually agreed upon. In the event of disagreement, the first name drawn has the right to choose the ground.

The result of each match must be sent by the winners to the Editor of THE CHEMICAL AGE, signed by all players (winners and losers), immediately after the match, and must reach the office of THE CHEMICAL AGE not later than by the first post on the day following the final day for playing off the round.

Having found their position in the draw, all that the players now have to do is to write or telephone each other, decide on a suitable date, time and ground, play their matches and forward the results to us in accordance with the rules. Results of the first round matches and details of the draw for the second round will be published as soon as the first round is completed.

Singles

Hayman, R. D.
Doulton & Co., Ltd., Lambeth, S.E.1. (Reliance 1241.)

v

Bruce, R. N. B. D.
Gas Light & Coke Co., No. 1 Laboratory, Kings Road, Fulham, S.W.6. (Fulham 5531.)

Baxter, Albert.
United Yeast Co., Ltd., 238, City Road, London, E.C.1. (Clerkenwell 0303.)

v

Backinsell, W. G. C.
Le Grand Sutcliff & Gell, Ltd., The Green, Southall, Middlesex. (Southall 2211.)

Shephard, H. L.
R. W. Greeff & Co., Ltd., Thames House, Queen Street Place, London, E.C. (Central 6550.)

v

Copp, C. G.
Doulton & Co., Ltd., Lambeth, London, S.E.1. (Reliance 1241.)

Giltrow, L.
Williams (Hounslow), Ltd., Hounslow. (Hounslow 2929.)

v

Dix-Perkin, A. L.
International Pulverisers, Ltd., 70, Victoria Street, London, S.W.1. (Victoria 2958.)

Nottingham, R. A.
Le Grand Sutcliff & Gell, Ltd., The Green, Southall. (Southall 2211.)

v

Choppin, F. H.
63, Woodyates Road, Lee, London, S.E.12.

Fradin, L. R.
Borax Consolidated, Ltd., Regis House, King William Street, London, E.C.4. (Mansion House 8332.)

v

Hammond, G. F.
Williams (Hounslow), Ltd., Hounslow, Middlesex. (Hounslow 1166.)

Blow, D. G.
The British Drug Houses, Ltd., 16-30, Graham Street, City Road, London. (Clerkenwell 3000, Ext. 23.)

v

Hare, H. A.
Grindley & Co., Ltd., Upper North Street, Poplar, London, E.14. (East 0058.)

Tickner, Arnold.
British Celanese, 22 & 23, Hanover Square, London, W.1. (Mayfair 8000, Ext. 137.)

v

Steel, H. A.
Society of Chemical Industry, Central House, 46 and 47 Finsbury Square, London, E.C.2. (Met. 3773.)

Byes

Whittaker, H. R.
Williams (Hounslow), Ltd., Hounslow, Middlesex. (Hounslow 1166, Ext. 7.)

Marcar, A. S.
Bovril, Ltd., 148-166, Old Street, London. (Clerkenwell 1202.)

Maronge, L. A.
Bakelite, Ltd., 68, Victoria Street, London, S.W.1. (Victoria 5441.)

Lacy, E. D.
Murex Welding Processes, Ltd., Ferry Lane Works, Forest Road, Walthamstow, London. (Larkswood 2284.)

Trigg, G. H.
Bovril, Ltd., 148-166, Old Street, London, E.C.1. (Clerkenwell 1202.)

English, Chas.
S. H. Johnson & Co., Ltd., Carpenters Road, Stratford, London, E.15. (Maryland 3657.)

Grape, L. F.
Borax Consolidated, Ltd., Regis House, King William Street, London. (Mansion House, 8332.)

Thomsett, E.
British Oxygen Co., Angel Road, Edmonton. (Tottenham 2488.)

Wilson, J. S.
British Celanese, Ltd., 22/3, Hanover Square, London, W.1. (Mayfair 8000, Ext. 137.)

Window, John.
Spencer, Chapman & Messel, North Woolwich Road, Silvertown, London. (Albert Dock 2168.)

Welsh, R.
British Oxygen Co., Angel Road, Edmonton. (Tottenham 2488.)

Law, Rupert S.
Howards & Sons, Ltd., Uphall Works, Ilford, Essex. (Ilford 1113.)

Porter, Ronald F.
Howards & Sons, Ltd., Uphall Works, Ilford. (Ilford 1113.)

Pritchard, F.
Le Grand Sutcliff & Gell, Ltd., The Green, Southall. (Southall 2211.)

Peake, I. R.
R. W. Greeff & Co., Ltd., 4, Thames House, Queen Street Place, London, E.C.4. (Central 6550-9.)

Alldis, W. L.
Brandhurst Co., Ltd., Vintry House, Queen Street Place, London, E.C.4. (Central 1411.)

Collins, A.
The British Oxygen Co., Ltd., Angel Road, Upper Edmonton, London. (Tottenham 2647.)

Smith, P.
Bakelite, Ltd., 68, Victoria Street, London, S.W.1. (Victoria 5441.)

Williams, I.
Monsanto Chemical Works, Ltd., Ruabon, North Wales. (Ruabon 3.)

Tunstall, P. A.
Salt Union, Ltd., 20, Water Street, Liverpool. (Central 4370.)

Whittaker, Edwin.
A. C. Wells & Co., Ltd., Carnarvon Street, Cheetham, Manchester. (Blackfriars 8044.)

Speakman, W.
Monsanto Chemical Works, Ltd., Ruabon, North Wales. (Ruabon 3).

Chaloner, S. E.
Monsanto Chemical Works, Ltd., Ruabon, North Wales. (Ruabon 3.)

Jones, Leonard.
Chance & Hunt, Ltd., Park Lane, Oldbury, Worcs. (Broadwell 1521.)

Doubles

Marcar, A. S., & Trigg, G. H.
Bovril, Ltd., 148-166, Old Street, London, E.C.1. (Clerkenwell 1202.)

v

How, M. H., & Shaw, J.
Johnson, Matthey & Co., Ltd., 78, Hatton Garden, London, E.C.1. (Holborn 6989.)

Thomsett E., & Welsh, R.
British Oxygen Co., Ltd., Angel Road, Edmonton. (Tottenham 2488.)

v

Hudson, J., & Maronge, L. A.
Bakelite, Ltd., 68, Victoria Street, London, S.W.1. (Victoria 5441.)

Badger, E. H. M., & Bruce, R. N. B. D.
Gas Light and Coke Co., No. 1 Laboratory, Fulham. (Fulham 5531.)

v

Porter, R. F., & Law, R. S.
Howards & Sons, Ltd., Uphall Works, Ilford, Essex. (Ilford 1113.)

Harbour, S., & Eckett, B. J.
Williams (Hounslow), Ltd., Hounslow, Middlesex. (Hounslow 1166.)

v

Collins, A., & Sibley, H.
The British Oxygen Co., Ltd., Angel Road, Upper Edmonton, N.18. (Tottenham 2647.)

Stanford, G., & Shirreff, J.
Johnson, Matthey & Co., Ltd., 78, Hatton Garden, London, E.C.1. (Holborn 6989.)

v

Blow, D. G., & Russell, L. W.
British Drug Houses, Ltd., 16-30, Graham Street, City Road, N.1. (Clerkenwell 3000, Ext. 23.)

Smith, P., & Francis, B. T.
Bakelite, Ltd., 68, Victoria Street, London, S.W.1. (Victoria 5441.)

v

White, F. C., & White, A. W.
Howards & Sons, Ltd., Uphall Works, Ilford. (Ilford 1113.)

Tickner, A., & Wilson, J. S.
British Celanese, Ltd., 22/3, Hanover Square, London, W.1. (Mayfair 8000, Ext. 137.)

v

Allen, F. R. O., & Bennett, R. A. J.
Nobel Chemical Finishes, Ltd., Slough, Bucks. (Slough 528/537.)

O'Connor, F., & Dacre Lacy, E.
Murex Welding Processes, Ltd., Ferry Lane Works, Forest Road, Walthamstow, E.17. (Larkswood 2284.)

v

Clarke, A. G. R., & Browne, E. C.
G. A. Harvey & Co. (London), Ltd., Woolwich Road, London, S.E.7. (Greenwich 0020, Ext. 311.)

Copp, C. G., & Hayman, R. D.
Doulton & Co., Ltd., Lambeth, S.E.1. (Reliance 1241.)
v
Rowlinson, H. R., & Whiteman, R. H.
British Drug Houses, Ltd., 16-30, Graham Street, City Road, London. (Clerkenwell 3000.)

Drew, H. W., & Baldock, W. G.
Williams (Hounslow), Ltd., Hounslow, Middlesex. (Hounslow 1166.)
v
Nottingham, R. A., & Pritchard, F.
Le Grand Sutcliff & Gell, Ltd., The Green, Southall. (Southall 2211.)

Miller, W. B., & Lord, G.
British Celanese, Ltd., Spondon, near Derby. (Derby 2200, Ext. 316).
v
Jones, Leonard, & Rhead, Alan V.
Chance & Hunt, Ltd., Park Lane, Oldbury, Worcs. (Broadwell 1521.)

Jones, C. H., & Blythe-Brook, P. N.
Anglo-Persian Oil Co., Ltd., Britannic House, Finsbury Circus, London, E.C.2. (National 1212.)
v
Prosser, V. J., & Baxter, A.
John Haig & Co., Ltd., Kinnaird House, 2, Pall Mall East, London. (Whitehall 1040.)

Pennington, R. C. & Pasquill, S.
J. Crosfield & Sons, Ltd., Warrington. (Warrington 800.)
v
Speakman, W., & Chaloner, S. E.
Monsanto Chemical Works, Ltd., Ruabon, North Wales. (Ruabon 3.)

Harper, W. M., & Gold, H. P.
I.C.I., Ltd., Oldbury, Birmingham. (Broadwell 1521.)
v
Hiscock, W. G., & Boyd, J. S.
Imperial Chemical Industries, Ltd., Grangemouth, Scotland. (Grangemouth 182.)

Hawley, F. G., & Haines, J.
Anglo-Persian Oil Co., Ltd., Britannic House, Finsbury Circus, London, E.C.2. (National 1212.)
v
Jones, E. M., & Eden, R. C.
B. Laporte, Ltd., Kingsway, Luton, Beds. (Luton 891.)

Willshere, A. E. C., & Grape, L. F.
Borax Consolidated, Ltd., Regis House, King William Street, London. (Mansion House 8332.)
v
Steel, H. A., & Choppin F. H.
Society of Chemical Industry, Central House, 46 and 47, Finsbury Square, London, E.C.2. (Met. 3773.)

The Law and Practice of Trade Marks

Report of Departmental Committee

THE report of the Departmental Committee on the law and practice relating to trade marks has now been published by H.M. Stationery Office (price 1s. 6d. net). This committee was appointed by the Board of Trade in January, 1933, to consider and report whether any, and if so what, changes in the existing law and practice relating to trade marks are desirable. Its members were Viscount Goschen (chairman), Mr. F .G. Brettell, Sir Edward T. F. Crowe, Mr. E. Davies, Mr. J. Rankine Finlayson, Mr. J. E. James, Sir Duncan Kerly, K.C., Lieut.-Col. A. N. Lee, Mr. M. F. Lindley, Sir Frederick H. Richmond, Bt., Mr. C. B. L. Tennyson, and Mr. W. Trevor Watson, K.C.

In the course of its inquiry the committee heard oral evidence by a number of witnesses representing various associations, bodies and persons. In addition, a large number of observations and suggestions in writing were considered.

The main conclusions include several recommendations which, if adopted, will involve fundamental changes in the existing trade mark law. The committee points out that some of these changes, notably those relating to the assignment of trade marks and the registration of users of registered trade marks, relate to matters of considerable importance and urgency to the commercial and industrial interests concerned.

In regard to the assignment of trade marks the committee came to the conclusion that the requirement for the transfer of the goodwill of the business on the assignment of a trade mark is unduly restrictive in the circumstances of modern business and ought in the interests of trade to be done away with altogether, and that a trade mark should be validly assignable for a part only of the goods for which it is registered provided that there does not arise by reason of such assignment or transmission a right for more than one independent proprietor to use the mark or a similar mark for the same goods or description of goods so as to be likely to deceive or cause confusion. The provisions allowing this greater freedom of assignment should also be retrospective in effect.

Authorised Users

The trend of modern commercial development requires some relaxation of the existing restrictions on the use of registered trade marks by persons other than the proprietor, and provision should be made for the registration under proper safeguards of persons authorised by a proprietor to use his registered trade mark. Moreover, the existing requirement of two years' user for registration in Part B of the Trade Marks Register should be abolished, and, as far as distinctiveness is concerned, it should be sufficient that a trade mark, in order to be registrable in Part B, should be capable of distinguishing the goods of the applicant either generally or in any home or export market or markets to which the registration may be limited. In determining whether a trade mark is so capable, the tribunal should be able to take into consideration the extent to which user of the trade mark or any other circumstance has in fact rendered it so capable of distinguishing.

Concerning "defensive trade marks," the committee came to the conclusion that provision should be made for the extended or defensive registration of a well-known registered trade mark consisting of an invented word or invented words, which has become identified with the proprietor to such an extent that the use of the mark by others on goods other than those for which the mark is registered would create the impression that their was a connection between those goods and the proprietor of the mark.

In view of the need for some protection for an advertised trade mark adopted by the public as a descriptive name of the article to an extent beyond the power of the trade mark proprietor to control, the principle of the existing common law rule, whereby a word which is or has become the name by which an article is commonly known is not protectable as a trade mark, should also be modified. In this connection Section 6 (1) of the Trade Marks Act, 1919, should be amended so as to allow the proprietor of a word trade mark in respect of a patented article or substance to preserve his exclusive rights in the mark if after a period of two years after the expiry of his patent he can show that his trade mark is not the only practicable name or description of such article or substance.

Extension of Legal Rights

The committee also came to the conclusion that the legal rights of the proprietor of a validly registered trade mark should be extended in certain directions and should be defined by reference to the acts which should constitute infringement according as the mark is registered in Part A or Part B of the Trade Marks Register and should, when the registration is in Part A, be deemed to be infringed by such acts whether or not the act complained of is likely to lead to the belief that there is a connection in the course of trade between the goods in relation to which the mark is used and the proprietor of the trade mark; in particular the proprietor should be empowered to prohibit in relation to his trade mark certain acts which might injure the reputation or impair the value of his mark.

The committee was, however, unable to make any recommendation with regard to a proposal that the proprietor of a registered trade mark should be empowered to attach to the sale of goods bearing his trade mark price-maintenance conditions which should run with the goods so as to be binding upon any retailer into whose hands the goods might come with notice of such conditions. This question of the enforcement of fixed-price conditions on the sale of trade-marked goods is only one section of the larger question of the enforcement of price and other restrictions on the re-sale of goods which raises broad considerations of policy extending beyond the proper limits of the inquiry.

PRODUCTION of camphor in Taiwan in 1933 amounted to 5,366,393 lb., compared with 5,848,028 lb. in 1932. The United States ranks as the outstanding market for Toiwan camphor. Of total shipments to foreign countries in 1933, valued at 2,962,727 yen, exports to the American market accounted for 2,329,636 yen. Shipments to Japan proper in the same period were valued at 1,174,428 yen.

Notes and Reports from the Societies

Institute of Fuel

New Officers and Members of Council

AT the anual corporate meeting of the Institute of Fuel, held in London on April 25, it was unanimously decided to invite Sir John Cadman, D.Sc., chairman of the Anglo-Persian Oil Co., to be president of the Institute for the year commencing October 17 next, and this position Sir John has accepted.

Mr. Roland Addy, managing director of the Carlton Main Colliery Co., Ltd., has been invited, and has agreed, to become a vice-president.

The following were also elected as ordinary members of the Council of the Institute:—Lieut.-Colonel J. H. M. Greenly, deputy chairman of Babcock and Wilcox, Ltd.; Mr. Isaac Lubbock, of the Fuel Oil Technical Department of Shell-Mex, Ltd.; Mr. James N. Waite, City Electrical Engineer, Hull; Dr. C. M. Walter, head of the Research Section, Birmingham City Gas Department; Dr. F. S. Sinnatt, director of research, H.M. Fuel Research Station (nominated by the Department of Scientific and Industrial Research); Mr. L. Marshall Jockel (nominated by the Electrical Power Engineers' Association); and Mr. R. R. Simpson (nominated by the Mining and Geological Institute of India).

The Council also announced that the Melchett Medal for 1934 will be presented to Dr. Bergius, of Heidelberg, in recognition of the valuable services he has rendered to the whole world, more particularly in connection with the hydrogenation of coal. Dr. Bergius will deliver the Melchett Lecture in London, and will be presented with this award in October next.

The Chemical Society

Mendeléeff Commemoration : The Periodic Law

THE centenary of the birth of Mendeléeff was commemorated by the Chemical Society on April 19, when Lord Rutherford delivered an address at the Royal Institution on "The Periodic Law and its Interpretation."

The conception of a periodicity in properties when the elements are arranged in the order of their atomic weights was advanced tentatively by Newlands in 1864, but Mendeléeff in 1869, said Lord Rutherford, was the first to enunciate the law clearly, to perceive its utility in correlating and even correcting the recorded chemical properties of the elements, and to make from it predictions which might be verified by later investigations. Mendeléeff's first table, published in 1871, bears a remarkable resemblance to that of the present day. He perceived the true place of the transition elements in the scheme, and did not hesitate to reverse the apparently discordant order of iodine and tellurium. Where his table demanded the presence of then unknown elements, he ventured to predict their properties, his prophecies being strikingly fulfilled by the subsequent discovery of scandium, gallium and germanium.

The discovery of argon and its congeners by Ramsay, at the close of the century, led, not to an alteration, but to a widening of Mendeléeff's scheme, the inert gases falling naturally into a group of zero valency and forming a transition between the halogens and the alkali metals. During this period, the periodic law lacked any theoretical background which might lead to its interpretation. Sir J. J. Thomson's recognition of the electron as a constituent of all atoms of matter, in 1897, first led to the conception of the electrical structure of matter.

Lord Rutherford himself has been intimately connected with much of the subsequent development in this field. From consideration of the scattering of α-particles by heavy atoms, he was led to the nuclear theory of the atom, according to which the mass of the atom is concentrated in a minute, positively charged nucleus, the charge on which is proportional to the atomic weight of the atom. The conception that the nuclear charge and ordinal number of an element might be the same was applied by Bohr in his theory of spectra. It was brilliantly verified by Moseley's work on the X-ray spectra of the elements, which fixed the true order of the elements, and showed that only 92 exist from hydrogen to uranium. Of these, only one—No. 85—stills awaits discovery.

The recognition of atomic number rather than atomic weight as defining the properties of the elements cleared away the apparent discrepancies in Mendeléeff's table. It has been found that most of the elements are actually complex, consisting of isotopes having the same nuclear charge but different masses. The chemical properties of isotopes, depending on nuclear charge, are identical. Properties depending on mass may differ sufficiently to render separation possible, as is the case with hydrogen and lithium. The rare gases have highly symmetrical, tightly bound configurations. Addition of successive electrons leads to the occupation of the next group of orbits, and runs parallel to the observed chemical properties of the elements. A periodic pattern is thereby obtained, repeating after inert gas, in which the transition elements and rare earths find a natural place.

Society of Chemical Industry

Birmingham Section : Nascent Soap

THE discovery of a cleansing process claimed to be twenty times more effective than ordinary soap was described by Mr. Archibald Rayner, B.Sc., F.I.C., in a paper read before the Birmingham and Midland Section of the Society of Chemical Industry on April 19, when Mr. H. W. Rowell presided.

Ordinary soap solutions—although universally used as detergents—have limited efficiency, and on this account friction and washing machines are necessary adjuncts in the case of most washing operations. From a study of the results obtained with a laboratory washing machine under standard conditions, said Mr. Rayner, it was found that "nascent soap" or soap produced in situ has a much enhanced detergent strength compared with the ordinary aqueous solution of preformed soap.

In the course of the determination of the efficiency of soap powders containing varying proportions of soap and soda ash, and using standard soiled cloth containing a known amount of colloidal graphite, mineral oil and fatty oil containing free fatty acids, the results recorded showed the cleansing to be inversely proportional to the amount of soap present. In an endeavour to find an explanation of this phenomenon, the tests were repeated, using a soil which was free from fatty oil and free fatty acids, with the result that it was found that the detergency of the powders was then proportional to the soap content, indicating that the small amount of soap produced by neutralisation of the free fatty acids in the oil, must have some remarkably high detergent activity. The correctness of this theory was confirmed by carrying out tests, in which a small amount of oleic acid was distributed on the cloth, by means of a benzine solution, and the cloth treated in this way, was found on immersion in a weak solution of sodium carbonate, to give a cleansing result which was far ahead of anything obtainable with ordinary soap solutions at their optimum concentration, *i.e.*, about 0.3 per cent. fatty acids. Further tests showed that 6 g. of fatty acids as soap flakes, were required to give a cleansing equivalent to that of 0.25 g. of oleic acid applied to the cloth, that is to say, over twenty times as much.

It was therefore evident that three factors might be coming into play to be responsible for this result. In the first place, concentration of soap in the fabric; secondly, increased detergent action of "nascent soap"; thirdly, increased detergency resulting from liberation of bubbles of CO_2. The extent to which concentration was exerting its influence was ascertained by incorporating soap into the fabric by means of an alcoholic solution and the subsequent removal of the alcohol. It was found that the amounts of fatty acids required to give the same cleansing effect were (1) as free oleic acid, 0.25 g.; (2) as soap distributed in the fabric, 1.76 g.; (3) as soap in aqueous solution, 5.9 g, showing that whilst increased concentration in the fabric means approximately an efficiency 3½ times greater than that of an aqueous solution, only one-sixth of the amount of fatty acid formed is required

to give the same result if the fatty acid is dispersed in the fabric and the soap produced in situ by treatment with alkali. The liberation of bubbles of CO_2 does not appear to be an important factor, as results equal to those obtained with sodium carbonate can be obtained with ammonia.

To take advantage of the increased detergency in ordinary washing, it was necessary to prepare an emulsion of oleic acid which on dilution with water would give a suitable solution for impregnating the fabric, and it was found possible to make such an emulsion by emulsifying the oleic acid with sulphonated castor oil and a small proportion of glue. The results obtained showed that in this condition, the soap produced had only a quarter of the efficiency of that produced from oleic acid, which had been applied in the salt. Nevertheless, six times the weight of fatty acids applied as soap flakes was necessary to get equivalent results.

The application of this process to practical washing, is described in Brit. Pat. 333,177 and its superiority, as compared with the usual process is amply confirmed, a much more rapid removal of dirt without friction being obtained, than by the usual operations, and apart from greater speed and ease of washing, the absence of friction gives a much improved result in the finished product, owing to the absence of shrinkage in the finished product and also extra dirt removal enhances the appearance of coloured articles. No explanation has been forthcoming for this increased detergency.

Association of Tar Distillers

New President : The Annual Dinner

MR. J. REGINALD LANE has been elected president of the Association of Tar Distillers in succession to Captain C. F. Ward Jones. Born in 1887, Mr. Lane was educated at King Edward VI's Grammar School, Lichfield, and received his chemical training at the Brownhills Chemical Works, owned by his family. Mr. Lane is chairman of the Lancashire Tar Distillers, the Normanby Park Tar Supply Co., Ltd., and the North-Western Co-operative Tar Distilleries, Ltd., deputy-chairman of the South-Eastern Tar Distilleries, Ltd., and a director of Lennard and Co. (Shoreham-by-Sea), Ltd.

Captain Ward Jones presided at the annual dinner at the Cafe Royal, Regent Street, London, last week, at which there were nearly 150 members and guests. The proceedings were of the usual informal character, but the dinner was noteworthy for the number of representative visitors present, chief among whom were Dr. E. Leslie Burgin, Parliamentary Secretary to the Board of Trade, Mr. L. Browett, of the Industries and Manufactures Department of the Board of Trade, Sir Percy Ashley, secretary of the Import Duties Advisory Committee, Mr. D. R. Wilson, chief inspector of factories, Mr. W. A. Damon, chief inspector of alkali works, Professor G. T. Morgan, of the Chemical Research Laboratories, Teddington, Mr. R. G. Clarry, M.P., chairman of the British Road Tar Association, and Colonel W. M. Carr, vice-president of the Institution of Gas Engineers and chairman of the Lancashire co-operative tar scheme.

Mr. J. R. Lane proposed the toast of the guests, and Dr. Burgin, Mr. Clarry, M.P., and Colonel Carr responded.

THERE are now about twelve plants in Italy manufacturing lacquers, and, in the absence of official statistics, it is estimated that the annual output of nitrocellulose lacquers reaches approximately 6,000 tons a year. The automobile industry is the largest consumer, taking from 60 to 70 per cent. of domestic lacquers, with body makers and refinishers using about 60 per cent. of the imported lacquers. The furniture industry is another outlet. The wooden-furniture manufacturers finish about 12 per cent. of their products with lacquers, while the metal-furniture producers utilise lacquer in about 45 per cent. of their products. Imports of nitrocellulose lacquers into Italy for the first eleven months of 1933 amounted to 789 tons, valued at 6,501,359 lire. The United States is the leading source of supply, furnishing about 60 per cent. of the total imports. Germany, second in the trade, represented by about 25 per cent. is followed by Great Britain with 8 per cent. and Austria with 6 per cent.

British Drug Houses, Ltd.

Effects of the Safeguarding of Industries Act

THE annual general meeting of the British Drug Houses, Ltd., was held in London on April 25. Mr. C. A. Hill, chairman and managing director, who presided, said that trading throughout 1933 did not maintain the early promise of the first three months, the general trade recovery of the country not being very apparent in the drug and fine chemical industry. Despite the difficult conditions the company's export trade, generally, had made further headway during the past year. Chief among the difficulties were the state of uncertainty in foreign markets, due to the vagaries of foreign exchanges, and the continued impoverishment of the markets themselves. The subsidiary companies in Canada and Australia were now affording more satisfactory results. In the company's foreign trade they were still handicapped by the duty imposed by the Import Duties Act on crude drugs and other raw materials not obtainable from Empire sources. The tax on fuel oil had also rised cost of production, and, as this could not be passed on to customers, it resulted in a diminution of profits. By increasing production costs these taxes placed them at a corresponding disadvantage in meeting the very keen competition in foreign markets.

It was gratifying, continued Mr. Hill, to refer to the continuance of the favourable effect of the Safeguarding of Industries Act. This had enabled the company to undertake successfully fresh manufacturers, with the concomitant increase in employment, rendering them independent of the rest of the world in these productions. The Safeguarding of Industries Act also afforded security for enterprise. As a noteworthy example of the stimulus afforded by the Act, the company's development plans included the erection of a new factory building on their Wharf Road site for the manufacture of fine chemicals. This extension in operations resulted from the increasing demand for fine chemicals, particularly vitamin and other biochemical products. The company's pioneer work in hormones and vitamins and the researches which had made it possible to issue these products in greater purity, received ever-increasing recognition. This was reflected in the rapidly growing volume of sales of radiostoleun, radiomalt, livogen, and many other medical and scientific products in which they had specialised. The work of reorganisation continued and was the inevitable outcome of the necessity for adapting a progressive business to modern conditions in the drug trade, which had been for some years and still was undergoing considerable change.

In conclusion the chairman moved the adoption of the report, which was seconded by Dr. Francis H. Carr, and unanimously adopted.

Alcohol from Maize

Possibilities in South Africa

THE South African Fuel Research Institute has just published a report on the commercial possibilities of producing alcohol from maize, and it reviews favourably the prospects for such a factory; these views, however, are entirely different from those in the first report published by the Institute. In this report, which is offered as the views of the chairman and not those of the Institute, it is mentioned that production costs will depend upon the quantity of raw material available, the by-products available and the distance from markets. If modern apparatus is used, the cost of production (for maize) should be 4½d. or 5d. per gallon and for (molasses) 2½d. to 4d. per gallon; this includes factory charges, insurance and labour. It is based on land and water being obtained free, and coal (for molasses) being delivered at the factory at 17s. 6d. per ton and (for maize) at 6s. 6d. or 7s. 6d. per ton. If the molasses to make a gallon of alcohol cost 3d. the total finished cost of the alcohol would be 6½d. or 7d. per gallon, and that is not considering the manufacture of manure from the residue. In the maize process 3 per cent. barley must be added. The cost of maize delivered at the factory would be 8s. a bag, and as each bag would probably yield eight gallons of alcohol the total factory cost per gallon would be 1s. 5d. This cost would be reduced by the proceeds from the sale of by-products.

News from the Allied Industries

Rubber

THE MONTHLY SUMMARY OF CROP RETURNS of 615 rubber producing companies, issued by the Rubber Growers' Association, shows that production during the first three months of the current year, at 66,053 tons, has been considerably in excess of that for the corresponding quaurters in recent years. The figure for the first quarter of 1933 was 59,482 tons. The largest proportional increase over last year is that shown by the 21 companies operating in India and Burma, whose return shows a rise from 292 tons in the first quarter of 1933 to 881 tons this year, although the latter figure is considerably below that of 1930 (1,397 tons). The largest producing group represented in the returns is composed of the 338 companies operating in Malaya, and this is the only group to show a reduction for the month of March, compared with the return for February. The reduction is from 12,109 tons to 11,767 tons, but the figure is in excess of that for March, 1933, which was 10,512 tons. The total returned by the Malaya group for the first quarter of this year is 36,857 tons, an increase from 34,614 tons in the first quarter of 1933.

Beet Sugar

THE BRITISH SUGAR BEET SOCIETY held its annual luncheon at the Hotel Victoria, London, on April 26. Lord De La Warr, proposing the toast of "The British Sugar Beet Industry," said that developments had taken place in other sections of the agricultural industry, and now they understood that the sugar beet industry was contemplating great developments along the same lines. A marketing scheme had already been submitted by the manufacturers. He could not, he said, comment upon it because it was *sub judice,* but he paid a tribute to the statesmanship that had been shown by refiners and manufacturers in the manner in which they had brought it forward. The arrangements for the forthcoming season were to be virtually the same as in the past. The Chancellor of the Exchequer and the Minister of Agriculture had, however, appointed a committee of inquiry to give them a full report on the whole industry. The industry had shown itself to be progressive and efficient, and behind it was a Government which, to say the least, was very friendly. Colonel E. Royds, in moving the adoption of the report, said the acreage under sugar beet last year was 366,000 acres, producing about 456,000 tons of sugar—an average of over nine tons an acre—the sugar content being 16.4. The total requirements of the country for the year were about 2,000,000 tons, or just under. Their home sugar production of 456,000 tons therefore accounted for nearly a quarter of the home consumption.

Paint and Varnish

PRESIDING AT THE TENTH ANNUAL GENERAL MEETING of Jenson and Nicholson, Ltd., held in London, on April 19, Mr. W. J. Ogden, F.C.A., said that the substantial improvement in the trading results for the year 1933 was due to the steady process of reorganisation which the directors had been carrying out, the effect of which had been to bring the company up to a high state of efficiency which would enable them to take much greater advantage of trading opportunities in the future. This reorganisation work was not due to any negligence or incompetence in the management in the past, but had been necessitated by the far-reaching changes in trading conditions which had been going on during the last few years; some of them peculiar to the paint trade and others affecting all classes of industry. Among the former he instanced the advent of cellulose lacquers, involving complete changes in methods of manufacturing and presenting a host of new problems; and among the latter the continued fall in commodity prices without any corresponding reduction in such items of cost as wages, salaries, and overhead expenses. Thanks to the efforts of the management, however, and particularly to those of the managing director, Mr. Bernard Nicholson, the company had been enabled to cope with the various problems presented by changing conditions so successfully that, in place of a net loss of £7,400, as was shown for the year 1932, there was now a net profit of nearly £29,000. Dealing with the prospects for the current year, Mr. Ogden said that though it was early to make any definite prophecy, he was able to state that the first three months of 1934 showed an increase in sales of 15 per cent. over the corresponding period of 1933, while the net profits for the same period, apart from the profits of subsidiary companies not yet ascertained, had increased by 25 per cent., and the directors saw no reason to doubt that, given reasonable trading conditions, the profits for 1934 would show considerable expansion over those for 1933.

Soap

THE FORTIETH ANNUAL GENERAL MEETING of the shareholders of Lever Brothers, Ltd., was held at Port Sunlight, on April 26, when Mr. Francis D'Arcy Cooper, chairman, presided, supported by Viscount Leverhulme (governor of the company). The capital expenditure for the year, said Mr. Cooper, amounted to £1,093,847, which has been financed by £1,698,000 written off for depreciation during the year. The remodelled soap factory at Calcutta and the new soap factory at Bombay will both be completed and in operation in the autumn. Owing to increased tariffs in the Dutch East Indies the company has decided to erect a factory at Batavia; this factory will also be working in the autumn. The company is also in process of doubling the capacity of the glycerine refining plant and the toilet soap department in their factory at Shanghai. The balance on the profit and loss account is £6,200,697, to which must be added the £300,000 no longer required, taken from the exchange reserve. The available profit is therefore £6,500,697, and out of this the company has paid the preference dividends and a dividend on the ordinary shares of 15 per cent. Selling prices have been reduced in all countries. The total tonnage was 2,093,000 tons—an increase of 85,000 tons—which represents a monetary turnover of £58,526,104. Sales of soap throughout the world show an improvement over 1932, and in the home trade soap sales increased during the year by 2.6 per cent.

Continental Chemical Notes

THE ROUMANIAN GOVERNMENT has granted a concession for ethyl acetate manufacture to the Temesvar Distillery.

* * *

AT THE RECENT ANNUAL MEETING of the Polish Potash Salts Co., in Warsaw, a loss of 1.70 millions zloty for 1933 was announced.

* * *

THE SWISS SANDOZ CONCERN records a successful year with an increased dividend of 20 per cent., against 18 per cent. for 1932.

* * *

SORBITOL IS THE STARTING POINT for a new synthesis of vitamin C (ascorbic acid) announced by Micheel and Kraft in a recent issue of "Naturwissenschaften."

* * *

GASOLINE NOT INTENDED FOR MOTOR SPIRIT must now be tinted, according to a recent French decree, with congo red in the proportion of 0.03 per litre.

* * *

WITH THE ENTRY OF A POLISH CONCERN, Dr. H. Zeumer, Nikolai, Upper Silesia, into the magnesium sulphate manufacturing field, that country is expected to become independent of foreign supplies which were formerly imported to the extent of 850 to 900 tons per annum.

* * *

PROPANE IS A BY-PRODUCT from the hydrogenation of lignite, which is coming into extensive use as an illuminant in certain parts of Germany where it is sold in the liquefied form in steel cylinders. Seven such cylinders, representing a net content of 100 kg. propane, are estimated to meet the annual requirements of an average household, although it is not to be regarded (writes A. Walden in "Metallbörse") as a competitor of town's gas, but rather as an auxiliary or emergency source of light and heat in areas not well served by a central supply.

Inventions in the Chemical Industry

Patent Specifications and Applications

THE following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Specifications Accepted with Dates of Application

IRON-SILICON ALLOYS and the metal resulting therefrom, treatment.—E. M. Freeland. July 11, 1932. 408,949.

WATER PAINTS, distempers, colour washes and the like, manufacture.—W. J. Tennant (Singapore Rubber Works, Ltd.). July 11, 1932. 408,930.

MATERIALS CONTAINING ETHONOL, manufacture.—Dr. L. Lilienfeld. July 15, 1932. 408,989.

ORGANIC CELLULOSE ESTER moulding powders, manufacture.—Kodak, Ltd. July 17, 1931. 408,952.

ACETYLENE, manufacture and production.—J. Y. Johnson (I. G. Farbenindustrie). Oct. 12, 1932. 408,934.

ORGANO-LEAD COMPOUNDS of phenols, manufacture.—E. I. du Pont de Nemours and Co. Oct. 20, 1931. 408,967.

HYDRATION OF OLEFINES.—Distillers Co., Ltd., W. P. Joshua, H. M. Stanley, and J. B. Dymock. Oct. 18, 1932. 408,982.

WATER-PROOFING WOOL.—Markel and Kienlin Ges. Oct. 21, 1931. 408,985.

CELLULOSE NITRATE, manufacture.—E. I. du Pont de Nemours and Co. Oct. 22, 1931. 409,008.

DISPERSIONS of conversion products of rubber, process for the manufacture.—I. G. Farbenindustrie. Oct. 24, 1931. 409,009.

AZO DYESTUFFS, manufacture.—I. G. Farbenindustrie. Oct. 26, 1931. 409,014.

FILTER CANDLES for the artificial silk industry.—M. Wilderman. Oct. 26, 1932. 409,023.

PRINTING COLOURS of the indanthrone series.—E. I. du Pont de Nemours and Co. Oct. 26, 1931. 409,029.

HIGH-MOLECULAR OXYGEN and thio-ethers, manufacture.—Henkel et Cie, Ges. Dec. 29, 1931. 409,030.

ABSOLUTE ALCOHOL, manufacture.—J. Rennotte. Nov. 18, 1932. 409,053.

PURIFICATION OF SULPHUR.—J. Y. Johnson (I. G. Farbenindustrie). Nov. 21, 1932. 409,055.

PURE SULPHUR, manufacture and production.—J. Y. Johnson (I. G. Farbenindustrie). Jan. 23, 1933. 409,098.

SEPARATING WAX FROM OIL, method of and apparatus for.—Standard Oil Co. March 18, 1932. 409,110.

ALKYLATED PHENOLS, process of preparing.—Rohm and Haas Co. March 23, 1932. 409,111.

CONTAINERS FOR LIQUEFIED GASES.—Linde Air Products Co. April 19, 1932. 409,113.

VINYL COMPOUNDS, production.—British Celanese, Ltd. April 16, 1932. 409,132.

PREPARING LIGHT SENSITIVE LAYERS on foils of regenerated cellulose, process.—J. Karafiat and J. Cerny. April 18, 1932. 409,134.

Complete Specifications Open to Public Inspection

SYNTHETIC MASSES, manufacture.—Dr. P. Meyersberg and Dr. G. Wolf. Oct. 19, 1932. 21360/33.

INSECTICIDAL COMPOSITIONS.—Grasselli Chemical Co. Oct. 19, 1932. 27760/33.

CARBON BLACK, production.—Soc. Française du Carbon-Alpha et de Ses Dérivés. Oct. 17, 1932. 28488/33.

ANTHRAQUINONO-2^1:1^1:1:2-ANTHRAQUINONES, manufacture.—I. G. Farbenindustrie. Oct. 20, 1932. 28958/33.

NEW DYESTUFFS of the anthraquinone series, process for the manufacture.—I. G. Farbenindustrie. Oct. 21, 1932. 29125/33.

DEPHENOLISING AMMONIA LIQUOR, process.—Koppers Co. of Delaware. Oct. 20, 1932. 29148/33.

CELLULOSE mixed and higher ester compositions containing trialkyl phosphates.—Kodak, Ltd. Oct. 21, 1932. 29170/33.

DEFOAMING OF LIQUIDS.—Deutsche Hydrierwerke Akt.-Ges. Oct. 22, 1932. 29326/33.

Applications for Patents

STAINS, VARNISHES, etc., manufacture and application.—Imperial Chemical Industries, Ltd., and A. A. Harrison. April 12. 11106.

ISATIN DERIVATIVES, manufacture.—Imperial Chemical Industries, Ltd., and M. Wyler. April 12. 11108.

AZO DYESTUFFS.—Imperial Chemical Industries, Ltd., and C. Paine. April 12. 11110.

DYEING PROCESS.—Imperial Chemical Industries, Ltd., and W. A. Sexton. April 13. 11171.

FLOTATION OF ORES.—Imperial Chemical Industries, Ltd. April 13. (United States, April 13, '33.) 11175.

NAPHTHALENE DERIVATIVES, manufacture, etc.—Imperial Chemical Industries, Ltd., R. P. Linstead and E. F. Bradbrook. April 16. 11468.

SEPARATION OF MIXTURES of toluene and methylcyclohexane.—Imperial Chemical Industries, Ltd., and H. G. Simpson. April 17. 11608.

TREATING METALS in fused salt baths.—Imperial Chemical Industries, Ltd. April 18. 11706.

NAPHTHYLAMINE DERIVATIVES, manufacture.—Imperial Chemical Industries, Ltd., and W. B. McKay. April 18. 11707.

INSOLUBLE AZO DYESTUFFS, manufacture.—Imperial Chemical Industries, Ltd., and W. A. Sexton. April 18. 11708.

TREATMENT of olefinic hydrocarbons.—A. L. Mond and Universal Oil Products Co. April 13. 11250.

DYEING ANIMAL FIBRES.—Soc. of Chemical Industry in Basle. April 12. (Hungary, April 12, '33.) 11064.

DYEING ANIMAL FIBRES.—Soc. of Chemical Industry in Basle. April 12. 11065, 11066.

CHROMIFEROUS DYESTUFFS, manufacture.—Soc. of Chemical Industry in Basle. April 17. (Switzerland, April 21, '33). 11558.

DESULPHURISATION of crude benzene.—I. Titz and N. Zelinsky. April 12. 11086.

PREPARATION of finely-divided sulphur.—H. Adams and Stockport United Chemical Co., Ltd. April 19. 11746.

INSECTICIDES AND FUNGICIDES, etc.—A. G. V. Berry and Trinidad Leaseholds, Ltd. April 21. 12092.

FILTERS.—F. P. Candy. April 23. 12101.

HETEROCYCLIC SULPHONIC ACIDS, manufacture.—A. Carpmael and I. G. Farbenindustrie. April 23. 12209.

VAT DYESTUFFS, manufacture.—A. Carpmael and I. G. Farbenindustrie. April 25. 12492.

DYEING PROCESS.—D. Carter, H. Jackson, A. Shepherdson, A. G. Cuthbert-Smith and Imperial Chemical Industries, Ltd. April 19. 11871.

PRODUCTION of foam for fire extinguishing.—H. H. Carter and Foamite Firefoam, Ltd. April 20. 11936.

PRODUCTS containing derivatives of cellulose.—Celluloid Corporation. April 24. (United States, April 26, '33.) 12302.

METHACRYLIC ACID, etc., production.—J. W. C. Crawford and Imperial Chemical Industries, Ltd. April 20. 12006.

ESTERS OF METHACRYLIC ACID, production.—J. W. C. Crawford, and Imperial Chemical Industries, Ltd. April 20. 12007.

RECOVERY, etc., of iodine.—H. D. H. Drane. April 25. 12431.

DISTILLATION of methylamine mixtures.—E. I. du Pont de Nemours and Co. April 19. (United States, April 19, '33.) 11857.

PRODUCTION of mixed esters of polyhydric alcohols, etc.—E. I. du Pont de Nemours and Co. April 20. (United States, April 20, '33.) 11995.

BLASTING EXPLOSIVES.—E. I. du Pont de Nemours and Co. April 23. (United States, April 21, '33). 12228.

BLASTING EXPLOSIVES.—E. I. du Pont de Nemours and Co. April 23. (United States, April 21, '33. 12229, 12230.

SEPARATION of alcohols.—E. I. du Pont de Nemours and Co. April 25. (United States, April 25, '33.) 12457.

CHROMIC ACID, etc., preparation.—W. V. Gilbert and R. E. Pearson. April 21. 12075.

LEADED AMMONIUM CHLORIDE CRYSTALS, manufacture.—Grasselli Chemical Co. April 20. (United States, April 20, '33). 11996.

HERBICIDES, INSECTICIDES, etc.—E. Hope. April 19. (New Zealand, March 15.) 11788.

COLOURING ARTICLES of bone, horn, etc.—I. G. Farbenindustrie and J. Y. Johnson. April 19. 11819.

SULPHUR, recovery.—I. G. Farbenindustrie and J. Y. Johnson. April 23. 12178.

PROTECTIVE COATINGS, production.—I. G. Farbenindustrie. April 19. (Germany, April 19, '33.) 11849.

STABLE PREPARATIONS of anaesthetic agents, manufacture.—I. G. Farbenindustrie. April 23. (Germany, April 22, '33.) 12206.

DYEING.—Imperial Chemical Industries, Ltd., C. S. Woolvin and H. A. Piggott. April 19. 11870.

DYEING CELLULOSE ESTERS, etc.—Imperial Chemical Industries, Ltd., L. P. Rendell and H. A. Thomas. April 20. 12005.

REFRIGERATION.—Imperial Chemical Industries, Ltd. April 21. 12097.

AZO DYESTUFFS, manufacture.—Imperial Chemical Industries, Ltd., and A. H. Knight. 12515.

SAMPLING LIQUORS containing suspended solids. Imperial Chemical Industries, Ltd. April 25. 12516.

BENZINES, production.—International Hydrogenation Patents Co., Ltd. April 24. (Germany, May 5, '33.) 12281.

Weekly Prices of British Chemical Products

Review of Current Market Conditions

THERE has been very little change in conditions in the chemical market during the week. Most sections have reported a fair amount of business and the tone is steady. Acetone, formaldehyde, formic acid, oxalic acid and salammoniac have been the strongest features in the industrial section, with a fair amount of business in sodium hyposulphite, sodium chlorate, saltcake, lithopone and acetic acid. The lighter coal tar products have received more attention, and creosote oil and cresylic acid have been active items. Prices for refined coal tar have not been very satisfactory, and pitch has excited little interest. Several price changes are reported in the essential oils section, where there is only a limited demand for most products. Prices of a number of perfumery chemicals have also varied during the week. Business in pharmaceutical chemicals has been on a moderate scale.

LONDON.—There is still a good steady demand for chemicals with prices firm. The coal tar products market continues firm and prices are unchanged from last week.

MANCHESTER.—Business on the Manchester chemical market this week has only been of moderate dimensions so far as new orders are concerned, although deliveries keep up at fairly satisfactory level. The movement of supplies to users in the woollen industry is better relatively than it is in the case of the Lancashire cotton trade, further improvement in which is slow. Sellers express the opinion this week that, particularly, in view of the approaching holiday season which is a long-drawn-out affair in Lancashire, some seasonal reaction would not be surprising. Meanwhile, quotations in most sections of the market this week have been steady and only here and there is any indication of easiness in evidence. With regard to the by-products market; many of the light materials have been in quieter demand. A feature of this section has been further weakness in carbolic acid, both crude and crystals for delivery over the second half of the year being quoted at lower rates. Pyridine, however, continues extremely firm and values this week have moved to higher levels.

SCOTLAND.—There has been increased activity in the Scottish heavy chemical market during the past week and inquiries for future business have been numerous.

General Chemicals

ACETONE.—LONDON: £65 to £68 per ton; SCOTLAND: £66 to £68 ex wharf, according to quantity.

ACID, ACETIC.—Tech. 80%, £38 5s. to £40 5s.; pure 80% £39 5s.; tech., 40%, £20 5s. to £21 15s.; tech., 60%, £28 10s. to £30 10s. LONDON: Tech., 80%, £38 5s. to £40 5s.; pure 80%, £39 5s. to £41 5s.; tech., 40%, £20 5s. to £22 5s.; tech., 60%, £29 5s. to £31 5s. SCOTLAND: Glacial 98/100%, £48 to £52; pure 80%, £39 5s.; tech. 80%, £38 5s. d/d buyers' premises Great Britain. MANCHESTER: 80%, commercial, £39; tech. glacial, £52.

ACID, BORIC.—Granulated commercial, £26 10s. per ton; powder, £28 10s. in 1-cwt. bags d/d free Great Britain in 1-ton lots upwards.

ACID, CHROMIC.—10½d. per lb., less 2½%, d/d U.K.

ACID, CITRIC.—LONDON: 9½d. per lb.; less 5%. MANCHESTER: 9½d.

ACID, CRESYLIC.—97/99%, 1s. 8d. to 1s. 9d. per gal.; 98/100%, 2s. to 2s. 2d.

ACID, FORMIC.—LONDON: £45 per ton.

ACID, HYDROCHLORIC.—Spot, 4s. to 6s. carboy d/d according to purity, strength and locality. SCOTLAND: Arsenical quality, 4s.; dearsenicated, 5s. ex works, full wagon loads.

ACID, LACTIC.—LANCASHIRE: Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £48; pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £53; edible, 50% by vol., £41. One-ton lots ex works, barrels free.

ACID, NITRIC.—80° Tw. spot, £18 to £25 per ton makers' works, according to district and quality. SCOTLAND: 80°, £23 ex station full truck loads.

ACID, OXALIC.—LONDON: £47 17s. 6d. to £57 10s. per ton, according to packages and position. SCOTLAND: 98/100%, £48 to £50 ex store. MANCHESTER: £49 to £53 ex store.

ACID, SULPHURIC.—SCOTLAND: 144° quality, £3 12s. 6d.; 168°, £7; dearsenicated, 20s. per ton extra.

ACID, TARTARIC.—LONDON: 1s. per lb. SCOTLAND: B.P. crystals, 11d., carriage paid. MANCHESTER: 1s. 0¾d.

ALUM.—SCOTLAND: Lump potash, £8 10s. per ton ex store.

ALUMINA SULPHATE.—LONDON: £7 10s. to £8 per ton. SCOTLAND: £7 to £8 ex store.

AMMONIA, ANHYDROUS.—Spot, 10d. per lb. d/d in cylinders. SCOTLAND: 10d. to 1s. containers extra and returnable.

AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb., d/d.

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

AMMONIUM CARBONATE.—SCOTLAND: Lump, £30 per ton; powdered, £33, in 5-cwt. casks d/d buyers' premises U.K.

AMMONIUM CHLORIDE.—£37 to £45 per ton, carriage paid. LONDON: Fine white crystals, £18 to £19. (See also Salammoniac.)

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salammoniac.)

ANTIMONY OXIDE.—SCOTLAND: Spot, £26 per ton, c.i.f. U.K. ports.

ANTIMONY SULPHIDE.—Golden 6½d. to 1s. 1½d. per lb.; crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.

ARSENIC.—LONDON: £16 10s. c.i.f. main U.K. ports for imported material; Cornish nominal, £22 10s. f.o.r. mines. SCOTLAND: White powdered. £23 ex wharf. MANCHESTER: White powdered Cornish, £20 10s. at mines.

ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.

BARIUM CHLORIDE.—£11 per ton.

BARYTES.—£7 to £8 10s. per ton.

BISULPHITE OF LIME.—£6 10s. per ton f.o.r. London.

BLEACHING POWDER.—Spot 35/37% £7 19s. per ton d/d station in casks, special terms for contract. SCOTLAND: £8 in 5/6 cwt. casks for contracts over 1934/1935.

BORAX, COMMERCIAL.—Granulated, £15 10s. per ton; powder, £17 packed in 1-cwt. bags, carriage paid any station Great Britain. Prices are for 1-ton lots and upwards.

CADMIUM SULPHIDE.—2s. 7d. to 2s. 11d.

CALCIUM CHLORIDE.—Solid 70/75% spot, £5 5s. per ton d/d station in drums.

CARBON BISULPHIDE.—£30 to £32 per ton, drums extra.

CARBON BLACK.—3½d. to 5d. per lb. LONDON: 4½d. to 5d.

CARBON TETRACHLORIDE.—£41 to £46 per ton, drums extra.

CHROMIUM OXIDE.—10¾d. per lb., according to quantity d/d U.K. Green, 1s. 2d. per lb.

CHROMETAN.—Crystals, 3½d. per lb. Liquor, £19 10s. per ton d/d.

COPPERAS (GREEN).—SCOTLAND: £3 15s. per ton, f.o.r. or ex works.

CREAM OF TARTAR.—LONDON: £3 19s. per cwt.

DINITROTOLUENE.—66/68° C., 9d. per lb.

DIPHENYLGUANIDINE.—2s. 2d. per lb.

FORMALDEHYDE.—LONDON: £27 per ton. SCOTLAND: 40%, £28 ex store.

LAMPBLACK.—£45 to £48 per ton.

LEAD ACETATE.—LONDON: White, £34 10s. per ton; brown, £1 per ton less. SCOTLAND: White crystals, £33 to £35; brown, £1 per ton less. MANCHESTER: White, £32 to £34; brown, £31.

LEAD NITRATE.—£28 per ton. MANCHESTER: £27 10s. to £28.

LEAD, RED.—SCOTLAND: £25 10s. to £28 per ton d/d buyer's works.

LEAD, WHITE.—SCOTLAND: £39 per ton, carriage paid. LONDON: £37 10s.

LITHOPONE.—30%, £17 10s. to £18 per ton.

MAGNESITE.—SCOTLAND: Ground calcined, £9 per ton, ex store.

METHYLATED SPIRIT.—61 O.P. Industrial, 1s. 6d. to 2s. 1d. per gal. Pyridinised industrial, 1s. 8d. to 2s. 3d. Mineralised, 2s. 7d. to 3s. 1d. 64 O.P. 1d. extra in all cases. Prices according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.

NICKEL AMMONIUM SULPHATE.—£49 per ton d/d.

NICKEL SULPHATE.—£49 per ton d/d.

PHENOL.—8½d. to 9d. per lb. without engagement.

POTASH, CAUSTIC.—LONDON: £42. MANCHESTER: £38.

POTASSIUM BICHROMATE.—Crystals and Granular, 5d. per lb. net d/d U.K. Discount according to quantity. Ground 5½d. LONDON: 5d. per lb. with usual discounts for contracts. SCOTLAND: 5d. d/d U.K. or c.i.f. Irish Ports. MANCHESTER: 5d.

POTASSIUM CHLORATE.—LONDON: £37 to £40 per ton. SCOTLAND: 99⅔/100%, powder, £37. MANCHESTER: £38.

POTASSIUM CHROMATE.—6½d. per lb. d/d U.K.

POTASSIUM NITRATE.—SCOTLAND: Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 9½d. per lb. SCOTLAND: B.P. crystals, 9d. MANCHESTER: Commercial, 8½d. to 8¾d., according to quantity inh 2-cwt. drums; B.P., 9d. to 9¾d.

POTASSIUM PRUSSIATE.—LONDON: 8½d. to 8¾d. per lb. SCOTLAND: Yellow spot material, 8½d. ex store. MANCHESTER: Yellow, 8½d.

RUPRON (MINERAL RUBBER).—£16 10s. per ton.

SALAMMONIAC.—First lump spot, £41 17s. 6d. per ton d/d in barrels.

SODA ASH.—58% spot, £5 15s. per ton f.o.r. in bags.

SODA, CAUSTIC.—Solid 76/77° spot, £13 17s. 6d. per ton d/d station. SCOTLAND: Powdered 98/99%, £17 10s. in drums, £18 5s. in casks, Solid 76/77°, £14 10s. in drums; 70/73%, £14 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts 10s. per ton less. MANCHESTER: £13 5s. to £14 contracts.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—£22 per ton. LONDON: £23.

SODIUM BICARBONATE.—Refined spot, £10 10s. per ton d/d station in bags. SCOTLAND: Refined recrystallised £10 15s. ex quay or station. MANCHESTER: £10 10s.

SODIUM BICHROMATE.—Crystals cake and powder 4d. per lb. net d/d U.K. discount according to quantity. Anhydrous, 5d. per lb. LONDON: 4d. per lb. net for spot lots and 4d. per lb. with discounts for contract quantities. SCOTLAND: 4d. delivered buyer's premises with concession for contracts. MANCHESTER: 4d. net.

SODIUM BISULPHITE POWDER.—60/62%, £16 10s. per ton d/d 1-cwt. iron drums for home trade.

SODIUM CARBONATE (SODA CRYSTALS).—SCOTLAND: £5 to £5 5s. per ton ex quay or station. Powdered or pea quality 7s. 6d. per ton extra. Light Soda Ash £7 ex quay, min. 4-ton lots with reductions for contracts.

SODIUM CHLORATE.—£32 per ton.

SODIUM CHROMATE.—4d. per lb. d/d U.K.

SODIUM HYPOSULPHITE.—SCOTLAND: Large crystals English manufacture, £9 5s. per ton ex stations, min. 4-ton lots. Pea crystals, £15 ex station, 4-ton lots. MANCHESTER: Commercial, £9 5s.; photographic, £15.

SODIUM META SILICATE.—£16 per ton, d/d U.K. in cwt. bags.

SODIUM NITRITE.—LONDON: Spot, £18 to £20 per ton d/d station in drums.

SODIUM PERBORATE.—LONDON: 10d. per lb.

SODIUM PHOSPHATE.—£12 10s. per ton.

SODIUM PRUSSIATE.—LONDON: 5d. to 5½d. per lb. SCOTLAND: 5d. to 5¾d. ex store. MANCHESTER: 4¾d. to 5¾d.

SODIUM SILICATE.—140° Tw. Spot £8 per ton d/d station, returnable drums.

SODIUM SULPHATE (GLAUBER SALTS).—£4 2s. 6d. per ton d/d. SCOTLAND: English material £3 15s.

SODIUM SULPHATE (SALT CAKE).—Unground Spot, £3 15s. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 5s.

SODIUM SULPHIDE.—Solid 60/62% Spot, £10 15s. per ton d/d in drums; crystals 30/32%, £8 per ton d/d in casks. SCOTLAND: For home consumption, Solid 60/62%, £10 5s.; broken 60/62%, £11 5s.; crystals, 30/32%, £8 2s. 6d. d/d buyer's works on contract, min. 4-ton lots. Spot solid 5s. per ton extra. Crystals, 2s. 6d. per ton extra. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8.

SODIUM SULPHITE.—Pea crystals spot, £13 10s. per ton d/d station in kegs. Commercial spot, £9 10s. d/d station in bags.

SULPHATE OF COPPER.—MANCHESTER: £14 15s. per ton f.o.b.

SULPHUR.—£10 15s. per ton. SCOTLAND: Flowers, £11; roll, £10 10s.; rock, £9; ground American, £10 ex store.

SULPHUR CHLORIDE.—5d. to 7d. per lb., according to quality.

SULPHUR PRECIP.—B.P. £55 to £60 per ton according to quantity. Commercial, £50 to £55.

VERMILION.—Pale or deep, 3s. 11d. to 4s. 1d. per lb.

ZINC CHLORIDE.—SCOTLAND: British material, 98%, £18 10s. per ton f.o.b. U.K. ports.

ZINC SULPHATE.—LONDON AND SCOTLAND: £12 per ton.

ZINC SULPHIDE.—11d. to 1s. per lb.

Pharmaceutical and Fine Chemicals

The following changes in the prices of pharmaceutical, photographic and perfumery chemicals are announced:—

MENTHOL.—A.B.R., recryst. B.P., 10s. per lb.; synthetic detached crystals, 8s. 3d. to 12s.

AMYL CINNAMIC ALDEHYDE.—8s. 3d. per lb.

LINALOL (ex Shiu Oil).—4s. per lb.

LINALYL ACETATE (ex Bois de Rose).—8s. 3d. per lb.

LINALYL ACETATE (ex Shiu Oil).—4s. 9d. per lb.

SAFROL.—1s. 7d. per lb.

Essential Oils

The following changes in the prices of essential oils are announced:—

ALMOND.—Foreign S.P.A., 9s. per lb.

ANISE.—2s. 6d. per lb.

BERGAMOT.—7s. 3d. per lb.

BOURBON GERANIUM.—23s. 6d. per lb.

CAMPHOR.—Brown, 97s. 6d. per cwt.; White, 97s. 6d.

CANANGA JAVA.—8s. 3d. per lb.

CASSIA, 80/85%.—4s. 6d. per lb.

CITRONELLA.—Java, 1s. 10d. per lb.; Ceylon, 1s. 8d.

CLOVE, 90/92% English.—3s. 10d.

LEMON.—4s. 6d. per lb.

LEMONGRASS.—4s. per lb.

ORANGE, SWEET.—6s. per lb.

PALMA ROSA.—6s. 9d. per lb.

PETITGRAIN.—4s. 6d. per lb.

SANDALWOOD.—Mysore, 18s. 6d. per lb.

Coal Tar Products

ACID, CARBOLIC.—Crystals, 8½d. to 9d. per lb.; crude, 60's, 2s. 11d. to 2s. 2½d. per gal. MANCHESTER: Crystals, 8d. per lb.; crude, 2s. 1d. per gal. SCOTLAND: 60's, 2s. 6d. to 2s. 7d.

ACID, CRESYLIC.—99/100%, 1s. 8d. to 2s. 3d. per gal.; pale, 98%, 1s. 6d. to 1s. 7d.; according to specification. LONDON: 98/100%, 1s. 3d.; dark, 95/97%, 11d. SCOTLAND: Pale, 99/100%, 1s. 3d. to 1s. 4d.; dark, 97/99%, 1s. to 1s. 1d.; high boiling acid, 2s. 6d. to 3s.

ANTHRACENE OIL.—Strained, 4½d. per gal.

BENZOL.—At works, crude, 9d. to 9½d. per gal.; standard motor, 1s. 4d. to 1s. 4½d.; 90%, 1s. 4½d. to 1s. 5½d.; pure, 1s. 7½d. to 1s. 8d. LONDON: Motor, 1s. 6½d. SCOTLAND: Motor, 1s. 6½d.

CREOSOTE.—B.S.I. Specification standard, 3½d. per gal. f.o.r. Home, 3¾d. d/d. LONDON: 3d. f.o.r. North; 4d. London. MANCHESTER: 3d. to 4¼d. SCOTLAND: Specification oils, 4d.; washed oil, 4¼d. to 4¾d.; light, 4½d.; heavy, 4¾d. to 4¾d.

NAPHTHA.—Solvent, 90/160%, 1s. 6d. to 1s. 7d. per gal.; 95/160%, 1s. 7d. to 1s. 8d.; 99/%, 11d. to 1s. 1d. LONDON: Solvent, 1s. 3½d. to 1s. 4d.; heavy, 11d. to 1s. 0½d. f.o.r. SCOTLAND: 90/160%, 1s. 3d. to 1s. 3½d.; 90/190%, 11d. to 1s. 2d.

NAPHTHALENE.—Purified crystals, £9 15s. per ton in bags. LONDON: Fire lighter quality, £3 to £3 10s.; 74/76 quality, £4 to £4 10s.; 76/78 quality, £5 10s. to £6. SCOTLAND: 40s. to 50s.; whizzed, 70s. to 75s.

PITCH.—LONDON: £2 17s. 6d. to £3 per ton f.o.b. East Coast port.

PYRIDINE.—90/140, 5s. 9d. to 7s. per gal.

TOLUOL.—90%, 2s. 4d. per gal.; pure, 2s. 7d.

XYLOL.—Commercial, 2s. 4d. per gal.; pure, 2s. 6d.

Intermediates and Dyes

ACID, BENZOIC, 1914 B.P. (ex Toluol).—1s. 9½d. per lb.

ACID, GAMMA.—Spot, 4s. per lb. 100% d/d buyer's works.

ACID, H.—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.

ACID NAPHTHIONIC.—1s. 8d. per lb.

ACID, NEVILLE AND WINTHER.—Spot, 3s. per lb. 100% d/d buyer's works.

ACID, SULPHANILIC.—Spot, 8d. per lb. 100% d/d buyer's works.

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.

BENZALDEHYDE.—Spot, 1s. 8d. per lb., packages extra.

BENZIDINE BASE.—Spot, 2s. 5d. per lb. 100% d/d buyer's works.

BENZIDINE, HCL.—2s. 5d. per lb.

p-CRESOL 34-5° C.—2s. per lb. in ton lots.

m-CRESOL 98/100%.—2s. 3d. per lb. in ton lots.

DICHLORANILINE.—1s. 11½d. to 2s. 3d. per lb.

DIMETHYLANILINE.—Spot, 1s. 6d. per lb., package extra.

DINITROBENZENE.—8d. per lb.

DINITROCHLORBENZENE, SOLID.—£72 per ton.

DINITROTOLUENE.—48/50° C., 9d. per lb.; 66/68° C., 10½d.

DIPHENYLAMINE.—Spot, 2s. per lb., d/d buyer's works.

α-NAPHTHOL.—Spot, 2s. 4d. per lb., d/d buyer's works.

β-NAPHTHOL.—Spot, £78 15s. per ton in paper bags; £79 5s. in casks, in 1-ton lots.

α-NAPHTHYLAMINE.—Spot, 11½d. per lb., d/d buyer's works.

β-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.

o-NITRANILINE.—3s. 11d. per lb.

m-NITRANILINE.—Spot, 2s. 7d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 4½d. per lb.; 5-cwt. lots, drums extra.

NITRONAPHTHALENE P.G.—1s. 0½d. per lb.

SODIUM NAPHTHIONATE.—Spot, 1s. 9d. per lb.

o-TOLUIDINE.—9½d. per lb.

p-TOLUIDINE.—1s. 11d. per lb.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 to £10. Grey, £15 to £16. Liquor, brown, 30° Tw., 7d. to 9d. per gal. MANCHESTER: Brown, £12 10s.; grey, £17 10s.

ACETIC ACID, TECHNICAL, 40%.—£17 to £18 per ton.

AMYL ACETATE, TECHNICAL.—95s. to 110s. per cwt.

CHARCOAL.—£5 10s. to £9 10s. per ton.

WOOD CREOSOTE.—Unrefined, 6d. to 9d. per gal.

WOOD NAPHTHA, MISCIBLE.—2s. 6d. to 3s. 3d. jer gal. Solvent, 3s. 9d. to 4s. 6d. per gal.

WOOD TAR.—£2 per ton.

Nitrogen Fertilisers

SULPHATE OF AMMONIA.—Home: £7 5s. per ton delivered in 6-ton lots to farmer's nearest station. Export: Nominal £5 17s. 6d. per ton f.o.b. U.K. ports in single bags.

CYANAMIDE.—£7 5s. per ton carriage paid to any railway station in Great Britain in lots of 4 tons and over.

NITRATE OF SODA.—£7 18s. 6d. per ton delivered in 6-ton lots to farmer's nearest station.

NITRO-CHALK.—£7 5s. per ton delivered in 6-ton lots to farmer's nearest station.

CONCENTRATED COMPLETE FERTILISERS.—£10 15s. to £11 6s. per ton according to percentage of constituents.

NITROGEN PHOSPHATE FERTILISERS.—£10 5s. to £13 15s. per ton according to percentage of constieuents.

Latest Oil Prices

LONDON, May 2.—LINSEED OIL, Spot, £21 (small quantities 30s. extra); May, £19 7s. 6d.; May-Aug., £19 12s. 6d.; Sept.-Dec. £19 17s. 6d.; Jan.-April, £20 2s. 6d., naked. RAPE OIL, crude extracted, £25 10s.; technical refined, £27, naked, ex wharf. COTTON OIL was quiet. Egyptian crude, £13; refined common edible, £15 5s.; deodorised, £16 15s. naked, ex mill (small lots 30s. extra). TURPENTINE was lower. American, spot, 47s. 9d. per cwt.

HULL.—LINSEED OIL, spot, quoted £19 17s. 6d. per ton; April, £19 5s.; May-Aug., £19 15s.; Sept.-Dec., £20, naked. COTTON OIL, Egyptian crude, spot, £12; refined common edible, £14; technical, £14; deodorised, £16, naked. PALM KERNEL OIL, crude, f.m.q., spot, £14 10s., naked. GROUNDNUT OIL, extracted, spot, £18; deodorised, £22. RAPE OIL, extracted, spot, £24 10s.; refined, £26. SOYA OIL, extracted, spot, £15 10s.; deodorised, £18 10s. per ton. COD OIL, 25s. per cwt. CASTOR OIL, Pharmaceutical, 35s.; first, 30s.; second, 27s. per cwt. TURPENTINE, American, spot, 49s. 9d. per cwt.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

Finland.—A firm in Helsingfors is desirous of representing a United Kingdom firm of sugar refiners. (Ref. No. 483.)

France.—An agent established at Paris wishes to obtain the representation, on a commission basis, of United Kingdom manufacturers and exporters of machinery for the chemical industry, mining and heavy metallurgy. (Ref. No. 484.)

Syria (Beirut).—A commission agent is desirous of getting into touch with United Kingdom manufacturers of chemical products, commercial (heavy) and pharmaceutical, patent medicines, paints and oil, varnish, etc. (Ref. No. 489.)

Forthcoming Events

May 7.—Society of Chemical Industry (London Section). Annual general meeting. "The Position of Analytical Chemistry and Advances Therein." Dr. J. J. Fox. 8 p.m. Burlington House, London.

May 8.—The Institution of Petroleum Technologists. "Lubricating Grease." Harvey S. Garlick. 5.30 p.m. Royal Society or Arts, John Street, Adelphi, London.

May 9.—The British Chemical and Dyestuffs Traders' Association, Ltd. Annual general meeting. 2.30 p.m. Howard Hotel, London.

May 9.—The Institute of Metals. Annual May Lecture. "Gases and Metal Surfaces." Professor E. K. Rideal. 8 p.m. Institution of Mechanical Engineers, Storey's Gate, London, S.W.1.

May 10.—Oil and Colour Chemists' Association. Annual general meeting. "Recent Developments in the Manufacture of Titanium Pigments." Douglas Wait and I. E. Weber. 7.30 p.m. 30 Russell Square, London.

May 11.—British Association of Chemists. Annual meeting. 7.15 p.m. Broad Street Station Restaurant, London, E.C.

Company News

Doulton & Co.—A dividend of 5 per cent., less tax, has been declared on the preference shares for the year 1932, payable on May 15.

Wall Paper Manufacturers, Ltd.—An interim dividend of 5 per cent., against 4 per cent., is announced on the deferred stock of the company. The ordinary stock receives the usual interim of 5 per cent.

The Tomaszow Artificial Silk Works, Warsaw.—The profits for 1933 are reported to be Zl.2,001,268, after providing Zl.2,619,087 for depreciation. After the deduction of 8 per cent. for the statutory reserve, the staff funds and tax provision, a dividend of 4 per cent., against nil, is proposed.

Broken Hill South.—A dividend of 1s. 6d. per share is announced payable in Melbourne on June 15.

From Week to Week

A VISIT WILL BE PAID jointly by members of the Bristol Section of the Society of Chemical Industry and the members of the South Western Counties Section of the Institute of Chemistry, to the Fruit and Vegetable Preservation Research Station, Campden, Gloucestershire, on Saturday, May 12, by kind permission of the Director.

EXTENSIONS ARE BEING CARRIED OUT this summer of the low temperature carbonisation plant at Askern, near Doncaster, to meet the increasing demand for coalite, fuel oil and petrol for the Royal Air Force. The additions include a complete battery of retorts and the necessary conveying gas treatment plant. It is hoped that the new works will be completed by October, and they will enable the Askern output of coalite, petrol and fuel oil to be increased by 17 per cent.

UNDER THE COMPULSORY LIQUIDATION of James L. Hatrick and Co., Ltd., Red Lion Street, Clerkenwell, the accounts show total liabilities £15,752, of which £9,139 is estimated to rank, against net assets, £1,692, after deducting £5,673 for payment of the debenture and preferential claims. The deficiency with regard to contributories is returned at £9,447. Mr. J. Barwick Thompson, Official Receiver, reports that the company was formed in December, 1897, to carry on the business of wholesale and retail chemists, druggists, drysalters, and dealers in surgical, medical and scientific instruments. The business appeared to have been originally founded in 1670. Down to 1924 the company exported a considerable quantity of goods to all parts of the world, particularly to the British Colonies, but the export trade steadily fell from a turnover of £17,225 in 1924 to £6,130 in 1933. In November, 1933, Mr. E. J. Mason was appointed receiver on behalf of the debenture-holder, and he stated that he was carrying on the business at a profit. The failure of the company is attributed by the directors and the secretary to the serious drop in the export trade, due to intense competition, the imposition of heavy duties, and to general trade depression. The court has appointed Mr. H. A. Deed, as liquidator, with a committee of inspection.

THE SIXTEENTH ANNUAL MEETING of the London Section of the British Association of Chemists will be held next Friday, May 11, at 7.15 p.m., at the Broad Street Station Restaurant, E.C., and will be followed by a smoking concert. Complimentary tickets may be obtained from the General Secretary, British Association of Chemists, 175 Piccadilly, London, W.1.

THE NEW EDITION of "Statistics of the Iron and Steel Industries," which contains figures from many countries, includes some further additions to make the statistics still more complete. The tariff section has been expanded and brought up to date, and the duties on iron and steel products imported into the United Kingdom are set out in full. The volume can be obtained from the offices of the National Federation of Iron and Steel Manufacturers, price 10s. 6d.

THE CHROME LEATHER INDUSTRY continues to show great activity and the production during the first three months of this year was higher than that for several years past. In spite of previous increases in the output of glazed kid the production of this leather continues to grow and the exports for the first two months of the year were 1,640,000 sq. ft. as compared with smaller quantities for the same period during 1932 and 1933. It is reported that a large glazed kid factory in the north of England is contemplating extensions to provide for 50 per cent. increased production of this leather. Cellulose finished sandal leathers have been in exceptionally good demand and one Midlands factory is about to start a night shift in order to cope with the demand for cellulose finished splits. Suede leathers of all kinds are having a great vogue this season and there is a good demand for the necessary dyestuffs and pigments. The glove leather trade is making provision for the demand for winter gloves and next season's leather is now well in hand. Most firms report substantial inquiries. The sole leather trade is quiet and the tanners are waiting for the buyers to adjust themselves to increased prices and possibly some time may elapse before there are any further developments.

MR. S. H. MENZIES AND DR. G. E. K. BLYTHE have been appointed directors of the Bluell Combustion Co., Ltd.

SIR HARRY SIMON SAMUEL, chairman of Antwerp Oil Wharves, Ltd., and J. C. and J. Field, Ltd., died at Monte Carlo, on April 26, in his 81st year.

IN THE ARTICLE ON ORGANIC REAGENTS FOR METALS, published in THE CHEMICAL AGE, April 28 (page 366) "dithiocarbazone" should read "diphenylthiocarbazone."

DR. HUGH O'NEILL is resigning his post as senior lecturer in metallurgy at Manchester University, on his appointment as research metallurgist with the L.M.S. Railway Company.

MR. W. ACKROYD BOWER, chairman and manager of Thomas Ness, Ltd., owners of the Black Banks Chemical Works, Darlington, has died at Harrogate. The company was taken over by Mr. Bower and a few friends 30 years ago, and branches were established at Blaydon, Littleburn, Norwood and Whitehaven.

THE TREASURY HAS MADE AN ORDER under Section 10 (5) of the Finance Act, 1926, exempting acid filicic and copper methyl arsenate from Key Industry Duty from May 1, 1934, to December 31, 1934. The Order will shortly be published by H.M. Stationery Office.

THE IMPORT DUTIES ADVISORY COMMITTEE has received applications for the continuance, after the date of expiry of the Import Duties (Drawback) (No. 7) Order, 1933, of drawback under Section 9 of the Finance Act, 1932, in respect of gutta-percha compound known as chewing gum base used in the manufacture of chewing gum and chewing sweets, and for an increase in the import duty on spools for photographic films and parts of such spools.

THE ANNUAL MEETING of the Pottery Section of the Ceramic Society will be held on Monday, May 14, at the North Staffordshire Technical College, at 7.30 p.m. Mr. Dunbar F. W. Bishop, the retiring chairman, may give a short address. Dr. J. W. Mellor, who is retiring from office as active secretary, will be presented with "Uncle Joe's Nonsense." This book illustrates the lighter side of Dr. Mellor's nature, and is being published by the Council of the Ceramic Society as a memento of Dr. Mellor's work. A paper on "Electro-magnetic Separators and Extractors for treating Pottery, Refractory and Building Materials" will be read by Mr. Wm. E. Box.

DR. D. TWISS, of the Dunlop Rubber Co., addressed the Oil Industries Club at their monthly luncheon on May 1. He stated that the connection between the rubber industry and oil went back to the commencement of rubber manufacture in this country and had continually progressed ever since. Rubber, which was formerly wasted, was transformed into solutions through the use of benzine and other solvents provided by the oil industry. The connection between oil and rubber, however, had become more intimate since 1912, when the petroleum industry caused a complete change in rubber manufacture by the introduction of carbon black, which was extracted from natural petroleum gas.

NOTICE WAS GIVEN in the "London Gazette" of April 20 that the partnership of Edmund Wade-Wilton, of Scarborough, manufacturing chemist, and William Hepworth, of Bramley, Leeds, manufacturing chemist, carrying on businesses as manufacturing chemists, analytical chemists and chemical engineers, at Planet Works, Bramley, Leeds, under the style or firm of E. Wade-Wilton and Son and the Wade-Wilton Synthetic Drug and Chemical Co., has been dissolved by mutual consent as from March 31. Debts due and owing to or by the firm will be received and paid by Mr. Hepworth, and the business will be carried on in the future by him.

MR. J. M. L. MITCHESON, H.M. Consul in charge of the Trade Department of the British Consulate-General at New York is proceeding to this country on a short visit. Mr. Mitcheson will be available at the Department of Overseas Trade on May 22 and 23 for the purpose of interviewing manufacturers and merchants interested in the export of United Kingdom goods to the United States of America, after which Mr. Mitcheson will visit a number of industrial centres in the provinces. Firms desiring an interview with Mr. Mitcheson in London or information regarding his arrangements to visit provincial centres should apply to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1, quoting the reference 24648/34.

A GENERAL MEETING of the Chemical Workers' Union was held in London on Saturday, April 28, when a resolution submitted by the National Executive Council declared that none of the promised advantages of tariffs had accrued to chemical and dyestuff workers, and therefore called for the repeal of tariffs and the regulation of foreign trading affecting the British chemical industry by means of import and export boards under Parliamentary control. "This legislation," said Mr. Arthur J. Gillian (general secretary), "has not put to work 25,000 chemical workers, as Mr. Baldwin promised it would. We can say that in proportion to developments in the industry the increase in the number of workers in three years behind these new walls is less than 5 per cent., and we wonder whether that 5 per cent. has not been completely eliminated by the organisation of short time."

MR. WILLIAM TIMPERLEY BATHO, a director of Sulzer Bros. (London), Ltd., died suddenly at Rio de Janeiro, on his way home from South America, March 26.

THE BRITISH COTTON AND WOOL DYERS' ASSOCIATION has bought Salisbury Mill, Ewood, Blackburn, which has been closed for three years.

A PAPER WRITTEN by Lieut.-Col. W. A. Bristow, president of the Low Temperature Coal Distillers' Association of Great Britain, was read at the Coal Congress in Berlin on April 27.

MR. HOLBROOK GASKELL, who for some time past has been chairman of the board of I.C.I. General Chemicals Group, has been appointed a director of Imperial Chemical Industries, Ltd.

FIVE THOUSAND EMPLOYEES at the Nottingham factories of Boots Pure Drug Co. will now be working a five-day week without any reduction of pay until September 29. During the "summer period" the factories and offices will be closed on Saturdays.

A PETITION FOR CONFIRMING THE REDUCTION of capital of Ruths International Accumulators, Ltd., from £500,000 to £180,703 5s. will be heard by Mr. Justice Bennett in the Chancery Division next Monday.

THE NORTHERN ALUMINIUM CO., LTD. has opened a London warehouse at 212/216 Pentonville Road, N.1 (Telephone No. Terminus 4512), where it will carry a comprehensive stock of aluminium and its various alloys in the form of ingots, plates, sheets, tubing, extruded sections, wire, rivets, powder, etc.

AN EXTRAORDINARY GENERAL MEETING of Doulton and Co. is to be held on May 15, to consider resolutions to convert the 350,000 5 per cent. cumulative preference shares and 400,000 ordinary shares of £1 each into stock, and to alter the articles of the Company to provide that the preference shall receive a cumulative 5 per cent. dividend, payable only out of profits.

AN EXTRAORDINARY GENERAL MEETING of Bovril, Ltd., was held on May 1 to consider a resolution for increasing the capital to £3,750,000, by the creation of 500,000 £1 pre-preference shares. Lord Luke, who presided, said the proceeds from the issue of these shares would be utilised in paying off the balance of the debentures in September.

THE ANCHOR CHEMICAL CO., LTD., of Clayton, Manchester, has been elected as an associate member of the American Chamber of Commerce in London. The Company was founded in 1892 by Mr. Thomas R. Hewlett, the present chairman of the directors. The company specialises in the manufacture and merchanting of compounding ingredients for the rubber and allied trades. In addition to works at Clayton, agencies and warehouses are maintained in London, Scotland, and the principal towns, in the Empire and on the Continent. The business was converted into a limited company in 1907.

TWO HUNDRED AND FORTY WORKERS are affected by the decision of Imperial Chemical Industries, Ltd., to close the works at Sedgwick (Westmorland) and Low Wood, near Ulverston. It is the intention of I.C.I. to transfer the manufacture of explosives to the works at Ardeer, Ayrshire. The directors, it is stated, wish to create as little hardship as possible, and the workers will receive some form of recognition for past services. For the same reason the longest possible notice has been given. Only a few of the workmen will be transferred to Ayrshire and over 200 will be unemployed.

GERMANY'S SHARE IN THE WORLD'S CHEMICAL INDUSTRY now amounts to 27½ per cent., compared with 25 per cent. five years ago. This statement was made by Professor Henglein, of the Technical Academy, of Karlsruhe, at the meeting of the Association of German Chemists at Cologne, on April 29. About 10 per cent. of the total German exports, said Professor Henglein, correspond to the chemical industry, but in 1933 this percentage advanced to 14, and in the current year a further increase is expected. Germany's import of chemical products is steadily decreasing, and to-day represents only 3 per cent. of the whole German imports. In 1928, the value of the German industrial output amounted to Rm.68,000,000,000, and the value of the farm products to Rm.12,000,000,000. The chemical output during that year was valued at Rm.4,000,000,000.

THE TREASURY HAS GIVEN EFFECT to recommendations of the Import Duties Advisory Committee that raw diatomaceous earth, as quarried; rosin (colophony), and raw tung oil (or china wood oil) would be added to the free list. The exemption from duty dates from May 4. Diatomaceous earth has a wide range of commercial uses, *e.g.*, for sugar and oil refining and in the dyeing and cleaning and chemical trades, and it is an important raw material for the manufacture of heat insulating materials. Recommendations have also been received from the Import Duties Advisory Committee regarding fruit preserved by chemicals or artificial heat (other than fruit preserved in sugar), and fruit (other than fresh fruit, fruit preserved in sugar, and dates), preserved by artificial cold, but, in accordance with the statement made by the Secretary to the Overseas Trade Department in the House of Commons on March 28, a decision on these recommendations is being deferred pending the discussions which are proceeding with the Netherlands Government.

ADVERTISERS please note that the latest hour at which we can accept advertisements for insertion in these columns each week is 10 o'clock on Thursday morning.

APPOINTMENTS WANTED

(Prepaid—Twenty-seven words 1s. 6d.; every additional nine words 6d.) Replies can be received "Box , Office of this Journal," in which case our address is included in cost of advertisement, and charged as nine words.

CHEMIST, B.Sc. Honours (33), four years' Technical Research Tar products; two years' assistant works manager Fertilisers, Insecticides, Plant Washes; 1½ years' works manager ditto, seeks change. Box No. 1595, THE CHEMICAL AGE, 154 Fleet Street, London, E.C.4.

BUSINESS OPPORTUNITIES

(1s. per line; minimum charge 3s.)

SPLENDID Opportunity for Chemist at Orpington Garden Estate. Modern Shop; write or call. Shops also available on Godstone Road, Whyteleaf, Surrey; particulars on request. E. O'SULLIVAN (KENLEY), LTD., Arterial Road, St. Mary Cray, Kent.

FOR SALE

(1s. per line; minimum charge 3s. Sixpence extra is charged when replies are addressed to Box Numbers.)

BALL Mill, silex lined, also Griveau Sifter and Mixer, with drawers. Box No. 1592, THE CHEMICAL AGE, 154 Fleet Street, London, E.C.4.

CENTRIFUGAL and Reel type Dressing Machines, in excellent condition, also 6 x 12 in. Granite Roller Mill. Box No. 1587, THE CHEMICAL AGE, 154 Fleet Street, E.C.4.

CHARCOAL, ANIMAL and VEGETABLE, horticultural, burning, filtering, disinfecting, medicinal, insulating; also lumps ground and granulated; established 1830; contractors to H.M. Government.—THOS. HILL-JONES, LTD., "Invicta" Mills, Bow Common Lane, London, E. Telegrams: "Hill Jones Pop., London." Telephone: 3633 East.

CIRCULAR type Horizontal Dryer with Agitator, also Gas-heated Drying Machine with brass internal fittings and revolving agitators. Box No. 1586, THE CHEMICAL AGE, 154 Fleet Street, London, E.C.4.

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